

30c

AUSTRALIAN

COUNTRY

JANUARY, 1970

MAGAZINE

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A black and white photograph of a man standing in a field of tall, leafy plants, likely corn. He is wearing a light-colored shirt and dark trousers. He is holding a stalk of the plant in his right hand and looking upwards towards the sky. The plants are dense and reach almost to the top of the frame.

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SPECIAL FEATURES

Small Man's Year at Orange, Col Begg	18
When to Sell Beef, Geoff Murray	34
Meet Our Best Customer, Hideo Ishikawa	36
Spend Money to Make Money Part II, I. Killen	38
Running People for Profit	58
Problem Free Contract Labor, K. Lloyd	62
Top End Beef Roads Grow	66
How to Beat Tractor Noise	85

LIVESTOCK

Fat Lambs Come to North Queensland, D. Wheatley	40
He Runs 170 Milkers on 200 Acres, C. Begg	48
Once a Year Feedlotting May Pay	50
Multipurpose Merino Fixed for Type, Jim Maple-Brown	54
Why Lamb Prices Were Low, J. Fotheringham	64
SA's Beef Testing Pioneer, H. Parker	68
Brahmans Proved in Cold Climates, J. B. Moran	81

CROPS and PASTURES

How to Get More From Mo	42
See How Their Maize Grows	53
Soil Test Uses and Limits, I. C. R. Holford	60
Soil Erosion is a Farm Cost, I. R. Carter	88
Ginger: Small Industry, Big Exports, A. W. Bosser	96

MACHINERY and EQUIPMENT

Sweet Water from the Sun, Roger Morse	44
Birds, Bees . . . and HELICOPTERS	66
Get the Most from Boom Sprays, Brian Tucker	73
Luxury on 10 Wheels, Col Begg	76
Giving Trees a Flying Start, J. Harrison-Smith	77
Irrigation for the Mini Farm	79

WOMEN'S MAGAZINE

Thumbs Down on Hot Summers . . . and Cold Winters, Sonya Begg	90
Party Line, Jane Dawson	92
Around the Homestead, Joan Marriott	92
Easy Ways to Preserve Flowers, Vee Picton	93

REGULAR FEATURES: Opinion 5, National Notebook 7, Is This Your Problem 11, Letters to the Editor 15, COUNTRY Reports 31, COUNTRY Looks at Books 32, Shooters' Country 84, Bush Telegraph 94.

NEXT MONTH: See full report page 98 of this issue.

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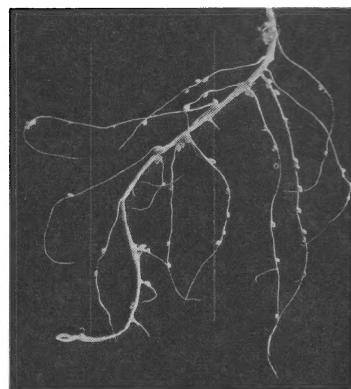
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JANUARY, 1970 Vol. 27, No. 6

EDITOR: GEOF MURRAY

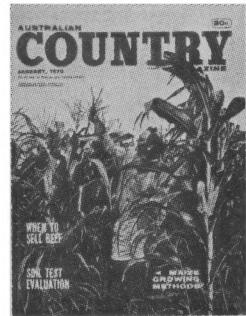
Assistant Editor: Col Begg



The role of molybdenum in legume establishment, and the right way to use it: see page 42 this issue.



Starting page 18 COUNTRY reviews the latest in farm machinery from the display at Orange National Field Days.



On page 25 we tell how America's top maize growers achieve outstanding yields. Cover shows KQ37, the new maize for Queensland.



The time to sell beef is critical for successful operation. The market pattern for major centres is shown page 34.

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COUNTRY 'OPINION'

JUST HOW DO YOU STAND?

The prophets of doom are out again howling about the black future for primary industry.

To deny there are real problems for sections of primary industry would be foolish in the extreme, for the facts are obvious every time one picks up a newspaper or magazine these days.

It has always been the farmer's responsibility to see that management of his products resulted in the return which would let him prosper for yet another year.

The farmer today has methods and techniques that were literally undreamed of by his father—and possibly himself—only a short time ago.

Things may not look good, but the ways of overcoming the problems are with us now, they only have to be applied intelligently, and quickly.

COUNTRY has the policy of bringing these developments to the attention of the farmer as quickly as possible.

In the present pressures on primary producers it is inevitable that some will go to the wall. Those that survive will be the ones who have been able to adapt themselves to the changed environment.

The change will have to come from within the ranks of the farmers themselves. The way to new products and projects can be discovered by the research teams, their work can be highlighted by service organisations like COUNTRY, but it is the farmer himself—the man reading this column—who decides whether or not to adopt the new principles.

In the quiet period over Christmas and New Year everyone should take time to assess his farm's position in the world.

There is a well established framework for this review:

Look at the overall position of the farm enterprises, be it wool, wheat, dairying . . . Demand is the first thing to study: what is the demand position now and what will it be in the future, is there a continuing need for the product, are there new goods that can be introduced, is it a product which will continue to be demanded, can customers pay for the product?

After demand, consider supply: is the industry capacity fully extended now, how will labor factors and material costs change, what are tax and operating costs going to do?

The third step in a review of the industry as a whole is competition: what is the nature of other farms, how is the industry organised, what government regulations affect operations?

After these points have been considered, look at the farm itself as a segment of the whole industry, starting with the market position it holds. Are farm sales on a par with other similar operations, are its products well regarded by buyers, what is the farm's reputation?

Next look at costs on the farm: is it in a favorable location for minimising costs, are the equipment and methods efficient, are there any unique cost advantages that put the farm ahead of competitors?

The last factor to consider is the farm's special competitive position, and this is the key to much that has gone before: how strong financially is the farm—and what is the ability of the farm manager?

A thorough and complete examination of all these factors should yield a mass of facts and figures, but more importantly it should put into perspective the problems which undoubtedly face each primary producer.

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By Peter Barnard

QUOTES OF THE MONTH

STATE FINANCES: First priority is being given reconsideration of Commonwealth-State financial relations by a Federal Government returned with only a working majority, and New Year announcements on this subject may be expected. Fresh agreement will certainly be reached by February.

* * * * *

35 HOURS: Land industry leaders are being urged to fall into line with industry and government interests preparing to counter a vigorous 35-hour week campaign to be mounted nationally by the trade union movement, and to be prepared to go to court on the issue in due course.

* * * * *

PROBATE CUTS: The Commonwealth Government still has to legislate its farm estate duty revisions, although these will be back-dated in effectiveness when they become law. They were a Country Party-sponsored election year idea. Benefits will range from raising the statutory exemption from \$20,000 to \$24,000 when the estate goes to a close relative of the deceased, to substantial reductions along the scale of duties payable on properties worth up to \$250,000. For example, probate on a holding valued at \$120,000 is to be halved.

* * * * *

SUPER TO SPARE: At a cost of nearly \$3m, the operating firm has proven the existence of at least 2000m tons of high-grade phosphate rock in north west Queensland, mostly easily worked. This is enough to satisfy Australia for centuries at its present rate of demand, and Government and company geologists, and academics, assert that the extent of the field will eventually be found to be far greater. Commercial announcements may be expected during 1970.

* * * * *

DRIP IRRIGATION: Farmer bodies in the irrigation areas, and groups and individuals elsewhere, should keep eyes on newer commercial, government, university and CSIRO work in several States on this intensive, water saving system pioneered in Israel and Italy.

* * * * *

ANIMAL DISEASE: A three year anti-brucellosis/TB campaign costing \$8m has been approved as a joint States-Commonwealth move to rid the country entirely of these diseases in cattle.

* * * * *

TARIFF INQUIRIES: Before the end of this financial year the Tariff Board hopes to have completed a wide-ranging review of its operations so far as agricultural and horticultural machinery imports are concerned. Any interests wishing to be heard on this question should lose no time in speaking up.

HAMBURGER TRADE: The value of this perennially contentious line of business continues to rise despite the scares and alarms. In 1969 Australia sold the US 225,000 tons of meat — 90 percent of it beef — worth \$200m, a gain of \$20m on the season before.

* * * * *

ECM TANGLE: Federal Government advisers discount warnings that Britain is (again) on the point of entering the European Common Market, one of the main factors continuing to keep the UK out being the mess the ECM farm economy is in — a state of affairs worsened by French and German currency juggling.

* * * * *

SUGAR SUBSTITUTES: Meeting in Canberra, the National Health and Medical Research Council ruled that State and Federal Governments be advised that sales of cyclamate sweeteners be drastically restricted and made subject to doctors' prescriptions. Use of the compound in foods and drinks is to continue under controls.

* * * * *

CORE TESTING: Federal Opposition policy makers are convinced that big economies can be effected by phasing in objective measurement as a basis for new style wool marketing, some placing the savings as high as 11 cents a pound greasy, or \$165m annually. Rural electorate representatives on the Government side are also deeply interested.

* * * * *

ATOMIC POWER: A nuclear power plant for Australia? The International Atomic Energy Agency expects that by 1975, over 21 countries, including smaller ones like Taiwan, Korea and Pakistan, will be operating a total of nearly 300, with an aggregate capacity of about 130,000mw.

* * * * *

QUOTA APPEALS: Favorable reviews of wheat quotas by State committees will result largely from the care farmers take in detailing their submissions properly, if the experience of recent months is a proper guide. Thorough documentation and responsible endorsement has made committees' work smoother, if not easier.

* * * * *

MIGRANT INFLOW: The Commonwealth Department concerned looks like succeeding this year in breaking its 1968-69 migrant intake record of 175,000 — a total to be annually stepped up until it hits 250,000, if European acceptors can be found. Such figures are a continual reminder to the farmer of the growth rate of his local market, which absorbs the great bulk of everything he produces except wool.

We must define areas of discontent with our policies.

—*Prime Minister Gorton.*

* * * * *

The world is now seeing evidence of coalition discord which has been apparent for a long time to Parliamentarians.

—*Opposition Leader Whitlam.*

* * * * *

The mineral boom? Why, the sheep industry is a mine that renews itself each year.

—*C. D. Renshaw, president United Farmers and Woolgrowers' Association.*

* * * * *

A workable solution to oversupply problems in the wheat, sugar and dairy sectors would be freely transferable quotas.

—*Gordon Barton, Convenor, Australia Party.*

* * * * *

That Australia rejects tied loans as a form of foreign aid, when they are used so successfully by our competitors in taking hold of developing markets in Asia and Africa, is to be deplored.

—*P. C. Murray, president, Australian Manufacturers' Export Council.*

* * * * *

We must have more industrial and political activity from farmers to bring out the fact that they are placed in a unique position economically; every other sector has some form of almost automatic appeal.

—*Peter Nixon.*

* * * * *

Europe has a butter stockpile equalling four years of Australian exports, and has sold some at 15 cents a pound.

—*Country Party Leader McEwen.*

Wherever you farm, whatever you farm, Massey-Ferguson have a better tractor for you, backed by on-the-farm-service and a full range of implements.

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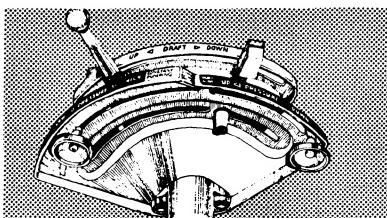
2. Two-way Draft Control gives automatic depth control of heavy or light mounted implements working deep or shallow in hard or soft conditions.

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5. Separate Response Control with its own switch and quadrant adjusts only the speed of lowering of mounted implements and this assists in maintaining traction at all times.

6. Pressure Control (a Massey-Ferguson exclusive) cuts wheelslip by as much as 50 percent when using trailed implements. Weight—from a few pounds up to two thousand pounds and more—is transferred from the implement to the tractor's rear wheels by simply moving a lever.

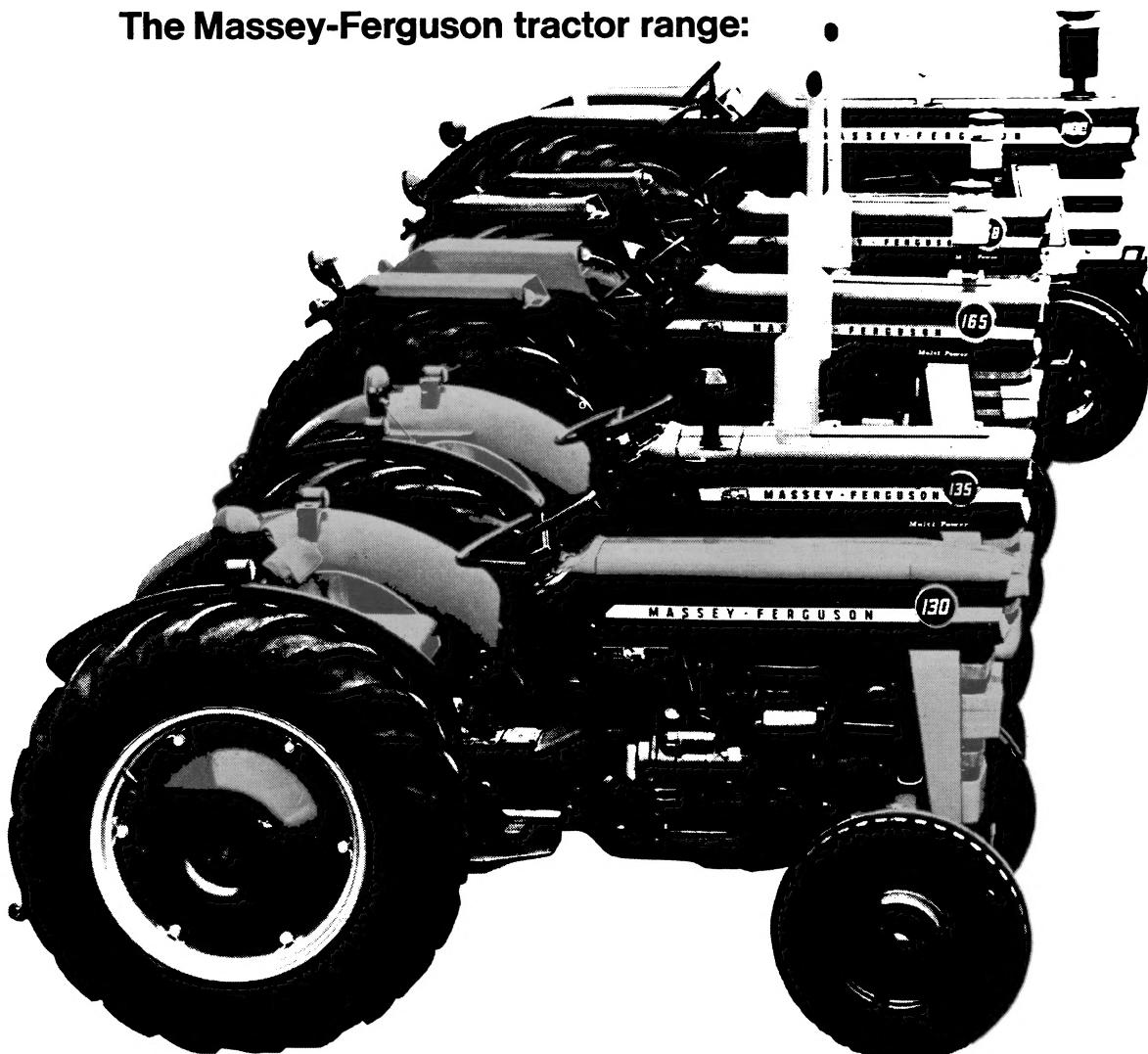


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The Massey-Ferguson tractor range:



MF 1100. Built to pull the big broadacre machines and wide-working implements in tandem hitch. Plenty of lugging power from the 6 cylinder 384 cubic inch direct injection diesel engine, and well over 7 tons all-up weight to handle the big ones. Pressure Control available for extra traction. Big, roomy, enclosed platform and air/oil suspended Airluxe seat, hydrostatic power steering, telescopic-tilting steering wheel, hydraulic power brakes, Multi-Power change-on-the-move 12 forward speeds. Wide range of hydraulic services including Ferguson System linkage, Pressure Control, two-lever spool valve remote control. Drawbar, linkage and rowcrop models.

MF 178. There's more power, more torque from a big 248 cubic inch direct-injection diesel engine and more than 4½ tons of weight going for you in this broadacre tractor. And, when you need more traction, Pressure Control automatically transfers the weight you select, from trailed implements to the tractor's

rear wheels. Advanced Ferguson System hydraulics, power steering, dry element air cleaner with pre-screener and pre-cleaner, spring suspension comfort seat, detachable steel rims, cast centres on all wheels are standard. Choose either standard six speed transmission or Multi-Power 12 speed, change-on-the-move.

MF 165. The versatile medium tractor. Big enough for a fair share of broadacre work yet economical on light jobs. More power from a 4 cylinder, 212 cubic inch direct-injection diesel engine. Advanced Ferguson System hydraulics with Pressure Control. Choice of standard 6 forward or 12 speed Multi-Power change-on-the-move transmissions. Diff. lock, hand brake, foot throttle, swinging drawbar, console with fuel gauge are some of the features that make the MF 165 the best equipped, best value tractor in its class. Standard or high clearance models.

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MF 135. For its size, this is the most complete, most versatile diesel you can buy. Powered to handle a 3 furrow mouldboard in most conditions. Single lever Ferguson System hydraulics, 8 forward speeds with synchro-mesh on the top level, live PTO, live hydraulics, diff. lock, independent disc brakes, foot throttle, hand brake, engine and ground speed drive PTO, built-in headlights, horn and registration kit, are all standard. Standard and narrow models.

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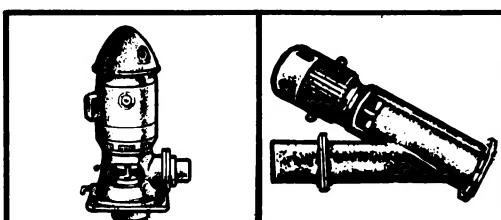
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Is this your PROBLEM?

By BOB ALLEN

TYRE PLY RATINGS

I have often been bombarded with technical information on tyres and I must admit most of it goes straight over my head.

The one problem, or rather query I have, concerns the ply rating. Does a six ply tyre mean that it has six plies or is it just technical jargon?

—C.L.B., Orange, NSW.

Before the war, according to Goodyear, tyre ply ratings WERE in actual fact a definite indication of the number of plies or layers of cotton fabric in the walls of a tyre, but today the ply rating means something entirely different.

It indicates the strength and load carrying capacity of the tyre.

This was brought about when nylon, rayon and other materials were used to replace cotton. As the cord strength increased, the number of plies and the number of cords per inch in the plies reduced, while they maintained, or in fact increased, the strength of the tyre.

FENCE POST PULLING

We were very interested to see your reply to S. Allen in the September issue of COUNTRY, concerning the carryall device for lifting star posts.

We manufacture a very simple tool which is most effective, can be operated by one man and costs only \$12.50.

—M. West, Sales Manager,
Cyclone K-M, SA.

Thank you for your interest on this subject. I can see by the accompanying blueprint that the unit is solidly built and should do the job without any trouble.

However, I would again like to point out that the idea I described in the September issue has one very big point in its favor. And that is that the carryall is right there under the operator's nose for loading the posts onto, when

they are pulled from the soil.

Of course, a tractor and carryall could follow up an operator with a manual post pulling device — but if he has a carryall on the hydraulics, why not let the tractor do the work? —B.A.

THE EASIEST WAY OF THE LOT!

"Belt the fence post at ground level with a sledge hammer and they come loose enough to be pulled by hand."

—N.J. Tambo, Qld.

MORE TRACTION NEEDED

On reading the article concerning half tracks in the Australian COUNTRY — "TRACTOR AND IMPLEMENT GUIDE," I thought they might be the answer to our problem.

We grow pineapples on fairly steep country and traction, as such, is not the real problem — the problem is, that we have to ensure that the tractor can get up the hills and down the other side, maintaining a constant speed, so that we can utilise the boom spraying equipment. We pull a trailer and 500 gal tank of water with the tractor and, naturally, the rate of application of fertiliser and insecticides from the boom spray must be constant.

What in your opinion, would be the best means of obtaining improved braking and traction necessary for this job. We have thought of duals, tyre chains, steel wheels and the half tracks, but because of other farm activities, the half tracks would not be needed all the time.

—P.H., Gympie, Qld.

Dual wheels and half tracks on light tractors give improved traction through better floatation in soft conditions. In wet, slippery conditions, wheel chains or girdles improve the traction,

(Continued next page)



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OWN A

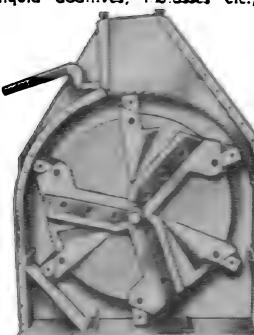
WETMORE

AND FORMULATE YOUR OWN FEED,
ANY KIND OF FEED, INTO A PALATABLE,
NUTRITIOUS AND PROFITABLE STOCK RATION

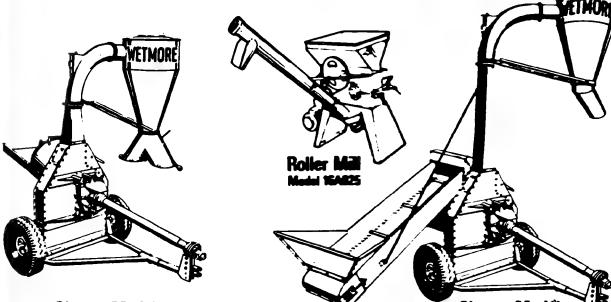
WETMORE KNIFE TYPE GRINDER MIXERS AND FEED MILLS are designed to produce a superlative stock feed ration, from any type of fodder, to any stock feed formula, including liquid additives, molasses etc., from coarse high moisture cattle roughage, to fine meals.

See for yourself, illustrated right, Wetmore's Combination Rotor, which combines knives, hammers, and air-ducts, all on one moving part. Wind velocity within the mill chamber for up-draft and discharge through the screen above the rotor, directs the grain to the hammer path for cracking by impact. Obliviates reworked sediment, plant cell destruction and churning of vitamins, minerals, proteins and grain germs into injurious wasteful dust.

WETMORE GRINDER MIXERS provide for spacious capacity and special features to mix and discharge the unrestricted range of feeds processed by Wetmore Feed Mills, designed for one man operation.



THERE IS A WETMORE MILL FOR EVERY NEED AND FEED.



WETMORE GRINDER MIXERS AND FEED MILLS have been progressively designed since 1929, now the biggest range of 'on the farm' feed processing machines in Australia, with the widest range of models, adaptations and applications.

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WETMORE PTY. LTD., Main South Road, Morphett Vale, S.A., P.O. Box 41, Morphett Vale Central, S.A. 5162. Phone: 54-7495. QLD.: WETMORE MACHINERY SERVICES, City Road, Beenleigh, 4207.

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ADDRESS.....

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Tomorrow's MINI-MAXI sheep *

*Minimum input, maximum profit

Fonthill's minimum objectives are:—

WOOL—Must be 64's (approx. 23 microns) or finer, with a growth of at least 2½ inches in 12 months. Quality must be maintained and improved. Mature ewes should cut 10 lb. and rams 15 lb.

MEAT—Conformation acceptable to the premium trades. Weight gain for single lambs to be 0.6 lb. per day up to at least 80 lb. live weight. Adult rams to weigh approximately 200 lb. and ewes 140 lb. Meat, fine grained and high ratio of red meat to fat.

FERTILITY—100% lamb markings, with 25% ewes having twins. This is believed to be the correct compromise for economic production today.

FONTHILL FIELD DAY

Monday, February 9, 1970

Combined with Annual Springfield and Fonthill Production Sale at which approximately 700 Fonthill and 1,500 Springfield ewes will be offered.

The field day will be opened by Dr. H. B. Carter of Leeds University, a leading authority on sheep breeding and wool.

You can benefit from the success of the Fonthill Merino Breeding Programme. Write for the booklet "Designing Tomorrow's Sheep" to:

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Phone: 3172D.



Is this your PROBLEM? continued

through the better grip.

Under normal conditions, increasing the weight of the driving wheels is generally considered to be the cheapest and most practical method. The important thing here is to ensure that the weight added to the tyre does not exceed the maximum recommended loading for that particular size.

Soil conditions and other pertinent factors must be considered when making a definite recommendation, but I would suggest that large section tyres, fully weighted with ballast would be the most practical method of improving traction for hill climbing. In firm soil, the skeleton type wheels should give good results for both hill climbing and descending. Duals would give better stability, but would prove to be too wide for inter-row work.

Half tracks would prove a most costly proposition which would not be warranted in your case, I would think.

SQUARE TUBING AVAILABILITY

I want to build up a small trailer for transporting stud sheep to shows and thought of making the frame from square section tubing. Would 1 in. square section 16 gauge be sufficiently strong for the job, and if so, could you give me an idea of the price.

—J.O.M., Bathurst, NSW.

I am presuming the tubing you refer to is welded tubing, and the strength of this when built up into a trailer would depend entirely on the design. If sufficient cross bracing exists in the design of the flooring, and the undercarriage is adequately attached, there is no reason why you should not get many years service from the trailer.

On referring the price problem to McPhersons of Sydney, they advised me that the section is known as a 351 ERW by 16 gauge. For lengths under 100 ft, the price is \$17.23 per 100 ft — for lengths over 100 ft but under 250 ft, the price is \$15.34 per 100 ft. It is readily available throughout the country and sells in 20 ft lengths.

FILTERS FOR SPRAY RACE

I am thinking of installing a spray race type of dip which would use recirculated spray. My problem is — what type of filters should I fit to the set up to handle the returned spray?

—G.W.H., Innisfail, Qld.

Unfortunately, I cannot give a recommendation on a filter system without a lot more information. Pump output, draining area, sump size and throughput of cattle all have to be considered in the calculations. In this regard, I think you would be well advised to put as much of this information as possible down on paper and send it to the Officer in Charge, Cattle Husbandry, Department of Primary Industries, Brisbane.

I believe that the DPI has a number of basic designs and layouts for this type of dip and should be able to give you a firm recommendation on the filtering system without any bother.

EASY TEST WELL DRILLING

I have just completed drilling a number of test wells with a hand auger, for assessing the efficiency of drainage. Is there an easier method for future jobs such as this — without the big expense of buying a powered auger.

—G.C.I., Bingara, NSW.

I know only too well what you are complaining about. Hand augers in my opinion should be thrown on the scrap heap.

An item which came to my notice recently, may be a good replacement of the auger for future jobs. It consists of a suitable length of ¾ in. water pipe fitted with a home made nozzle on the bottom end.

The nozzle is simply an end piece with a few holes drilled in it.

In operation, the pipe is connected to a good water supply which has a pressure of between 300 psi and 400 psi. The pipe is then placed on the ground and its own weight should be enough to start it downward into the ground. The hole it produces is usually big enough to take a 3 in. diameter casing.

Think fodder storage now!

Now's the time to install the best protection for costly fodder reserves — Cyclone specialised steel storage units to safeguard every kind of stock feed!

Cyclone Hayshed

Cyclone steel Haysheds are built to proven top-strength designs with first grade materials. Sizes to suit any property, simple to extend by adding bays or skillions.

Cyclone Bagged Grain Shed

Cyclone Bagged Grain Sheds are fully bird, rodent, and weatherproof. Ideal for long-term storage of feed, seed grains, concentrates etc. Truck height floor makes bag-handling easy.

Cyclone Silos

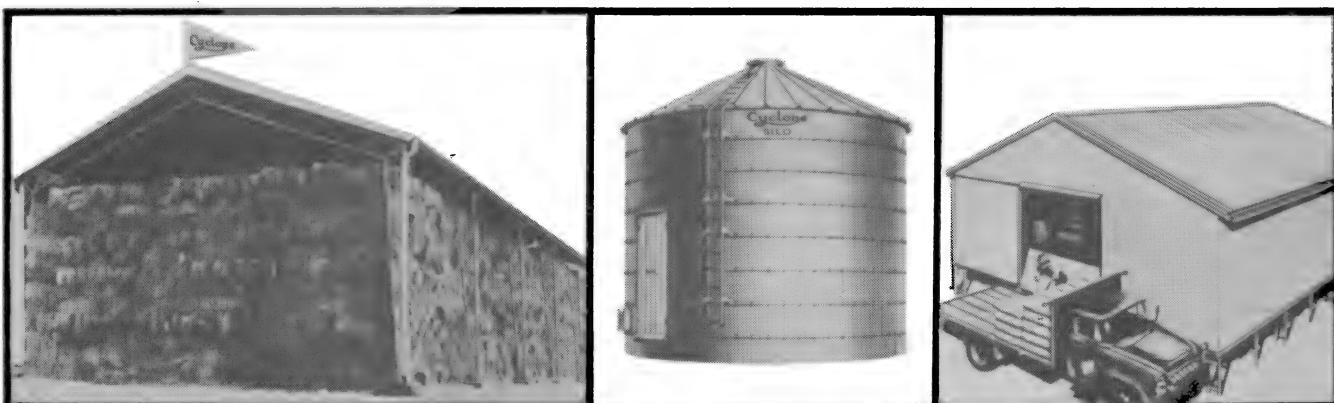
Cyclone Galvanised Steel Grain Silos are available in capacities from 200 to 3,700 bushels in on-ground or self-emptying elevated designs. All offer complete protection for any kind of fodder or seed grains with easy filling, cleaning and emptying with Cyclone Mobile Auger Equipment.

The Cyclone system of modular construction makes it easy and economical for you to get the best possible storage for hay, grain or concentrates, that will meet your needs exactly. And it's equally simple to extend Cyclone stock feed storage sheds to keep pace with your farm development.

Get ready for the coming harvest!

Put in Cyclone steel storage now for maximum protection for your valuable hay and grain reserves.

Cyclone Buildings are clad throughout with Lysaght Spandek or Custom Orb galvanised steel sheet — strongest, longest and neatest for cladding roof and walls. Precision made to last a life-time.



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Brisbane: Robinson Rd, Geebung, 4034

Townsville: Dalrymple Rd, Garbutt, 4810

Launceston: Fawkner Ave, King's Meadow, 7250

Buildings and silos installed for fodder conservation are now tax deductible in one year

See your Cyclone distributor for full details or post this coupon now!

Please send me without obligation full details on the following Cyclone stock feed storage units.

CY566

- Haysheds Bagged Grain Sheds Grain Silos
 200 Bushel 500 Bushel 1,200 Bushel to 3,700 Bushel
 On Ground Elevated

Name _____

Address _____

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Check if you wish to discuss the matter with your Cyclone representative. Check if for school project.

I want a friend... not just a contact



(Say hello to a friend.)

He is one of the Elders-GM representatives whom you have come to know so very well . . . thoroughly conversant with all of the technical aspects of the rural industry coupled with the on-the-spot *bush training* which gives him an awareness and genuine interest in your day to day problems.

From time to time he attends re-training programmes designed to keep him one step ahead of current trends.

Why don't you contact your man from Elders-GM next time you are making a decision about wool, stock, machinery, insurance or travel.



Elders-GM

for friendly, individual, on-the-spot service

Letters to the editor

COUNTRY invites readers to comment on any aspect of farming and grazing

HAND WEAVERS

Sir,

I would be grateful for an opportunity to reply to the comments made by Susan Wilson in her article "The Spinning Wheels of New Zealand" published in your August issue.

There is no need to wait for the spinning craze to catch on in Australia; it is already here! A quick look through many of the art and craft shops in Australia will show the selection of articles being made from Australian fleece, ranging from heavy floor rugs to fabrics and ties and including many of the bulky jumpers which attracted Mrs Wilson on her trip.

There are active guilds of handweavers and spinners in most States.

The Handweavers' and Spinners' Guild of Victoria was formed some 15 years ago and has over 400 members, many of whom are spinners. They include men, women and children and their ages range from eight to 80.

The aim of the guild is to bring weavers and spinners together and to develop in the community an awareness and appreciation of the textile crafts of weaving, spinning and dyeing. This is done by demonstrations, lectures, exhibitions and workshops.

Australian spinners have reason to be grateful to New Zealand for the manufacture of a spinning wheel which is now cheaply and readily available here. Spinning in Australia has perhaps greater scope than it does in New Zealand because of the greater variety of fleece produced here, ranging from superfine Merino through all classes and colors to the long-fibred Lincoln which gives a coarse carpet yarn.

The Australian Wool Board can be justly proud of the way Australian craftsmen and women are taking advantage of the range of Australian fleece to produce practical and beautiful articles.

I would like to extend to Mrs Wilson, and to anyone else who is interested in craft, an invitation to visit the annual exhibition of the guild which will be held at the Auditorium, Chadstone Shopping Centre, Melbourne in November each year and I am sure she will discover that Australian women are neither too affluent nor lacking in time but are just as interested as their New Zealand counterparts in using one of the most versatile natural fibres — wool!

(Mrs) A. E. Greenwood, Ormond, Vic, 3204.

LA TROBE AGRICULTURE COURSES

Sir,

In the September issue of COUNTRY you published a comprehensive list of agricultural science and related university courses. To be complete, a further course must be added. This is the four year course for the degree of Bachelor of Agricultural Science, established in 1968 at La Trobe University, Melbourne.

—N. Oddie, Ag.Sc.II, La Trobe University, Bundoora, Vic, 3083.

Apologies to La Trobe University. Details of its course in agriculture may be obtained from the university's registrar at the address shown under Neville Oddie's signature.

M&W TURBO- CHARGER

What does a Turbo-Charger Do?

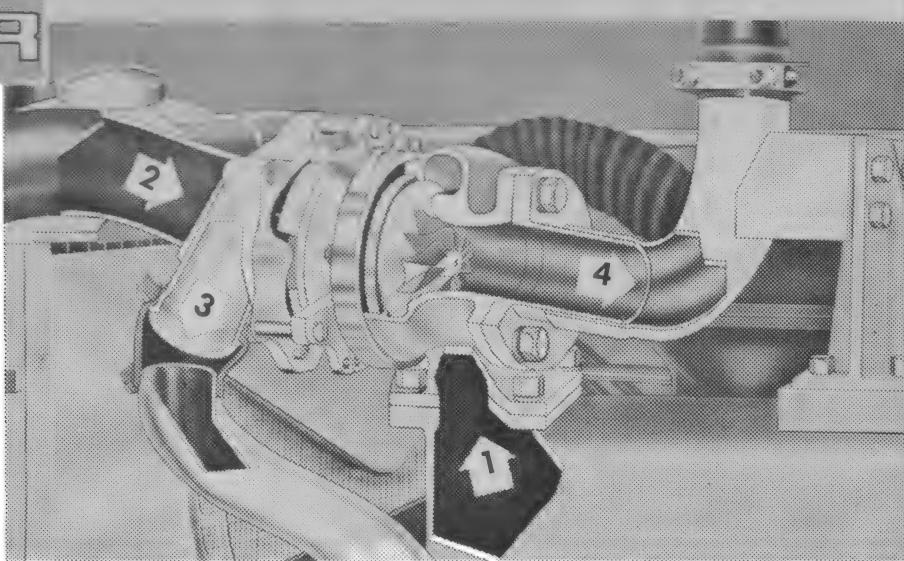
The two main benefits are —
(1) Improved Fuel Economy
(2) Increased Power

Both take place because the Turbocharged diesel has enough air to burn ALL the fuel that has been injected into the cylinders.

Tractor Model	Kit Charged	O. & W.	Turbo Observed H.P.	Test
Case 830 Hi Profile	T-8	77	64	
Case 830 Lo Profile	T-9	76.4	64	
Case 900, 900B ...	T-13	85.5	71	
Case 930 Comfort King	T-10	102.3	81	
Case 930 Lo Profile	T-11	102.3	81	
Case 930 Row Crop (2)	T-16	102.3	85.4	
Case 930 Comfort King Special (2)	T-17	102.3	(1)	
Case 1030	T-25	122	101.7	
Ford 5000-6X	T-22	68	56	
Ford 5000-6Y	T-26	78	57	
Ford 6000, 6000 Cmdr.	T-15	85	66.9	
IHC 560	T-3	75	60	
IHC 656	T-23	80	61.5	
IHC 660	T-6	95	79	
IHC 706 (282)	T-14	88	72	
IHC 706 (310)	T-27	92	76	
IHC 756	T-27	92	76	
IHC 806	T-7	115	95	
IHC 856	T-7	118	95(3)	
Deere 3010	T-2	73	69	
Deere 3020	T-4	78	65	
Deere 4010	T-24	110	84	
Deere 4020	T-24	115	91	
Deere 5010	T-5	145	121	
Deere 5020	T-5	154	132	
Moline G-VI, 704	T-19	100	78.5	
Moline 705, 706	T-18	125	101.6	

INTRODUCING A NEW CONCEPT IN DIESEL ENGINE EFFICIENCY

Improved Fuel Economy — 15-20% More Usable Power!



Here are Four Power-Boosting and Fuel-Saving Steps in the Turbo's Operation:

- (1) Exhaust gases from manifold enter Turbo and drive Turbine wheel, but never re-enter engine.
- (2) Fresh air from air cleaner is sucked into the Turbo and compressed, then
- (3) Pumped into regular intake manifold so each cylinder can be completely oxygen-charged.
- (4) Turbine-cooled exhaust heads up the stack so quietly the muffler can often be eliminated.

For Further Information Contact —

J. T. ELLIS & SONS

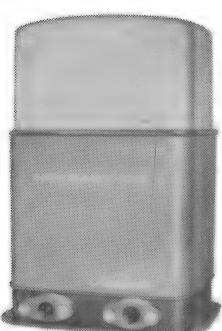
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QUEENSLAND, 4610. Phone 126.

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THE LEADER OF THE FIELD

Production improvements enable price reduction.

NOW ONLY \$120

This is a complete 240 volt, fully automatic water pressure system. 12 months' guarantee. Hundreds of units are operating satisfactorily all over Australia.



Only 12 $\frac{1}{4}$ " x 10 $\frac{1}{2}$ " x 17 $\frac{1}{4}$ ". Delivers up to 15 lb. pressure. Operates 3 taps at once.

Max. capacity 4 g.p.m.

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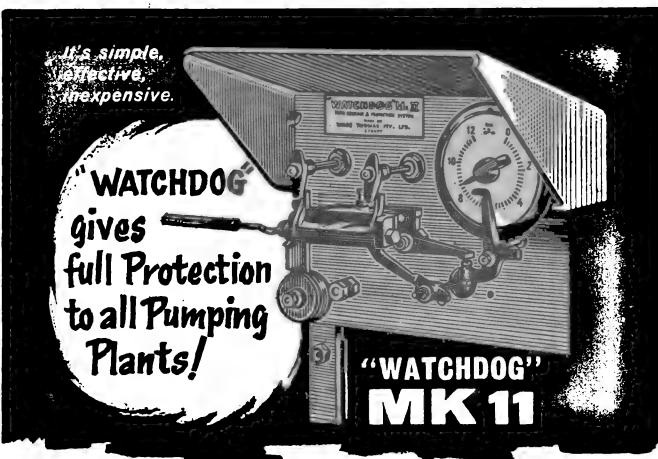
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TIME: Just dial the number of hours run required. Standard dial is for up to 12 hours. Twenty four hour dial is available.

OIL PRESSURE: "Shut-down" adjustable from 10 lbs per square inch to 70 lbs.

IRRIGATION PUMP PRESSURE: "Shut-down" adjustable from 10 lbs per square inch to 70 lbs.

VERY LOW PRESSURES: Special element has "shut-down" pressure adjustable from 1 lb per square inch to 12 lbs per square inch.

WATER TEMPERATURE: "Shut-down" temperature adjustable from 160 deg. F. to 220 deg. F.

VACUUM CONTROLS: Shuts the engine down if the irrigation pump loses prime.

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FOR NON-ELECTRIC PUMPING - WATCHDOG MKII

TODAY'S RESEARCH TOMORROW'S PROFIT

A COUNTRY feature bringing you the latest in research from around the world.

RELATIONSHIP BETWEEN NITROGEN AND SULPHUR: Greenhouse studies with wheat, maize and beans showed that when sulphur supply becomes a limiting factor the provision of extra nitrogen does not improve plant yield or protein level. The extract in Fertiliser, Feed and Pesticide Journal of a report by Stewart and Porter goes on to say that with sulphur, inadequately available extra nitrogen then increases the non-protein content of the plants. This work suggests that one part of sulphur is needed to every 12 to 15 parts of nitrogen for maximum production of dry matter and protein. As the use of nitrogen fertilisers increases, the risk of sulphur deficiency also increases.

* * *

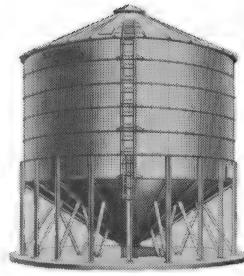
INDUCTION OF OESTRUS BY HORMONES: In a study reported by H. Epstein and S. Kadman in the Journal of Agricultural Science, 89 lactating sows which had farrowed at least once before were given 140 injections with 2000, 1800 and 1500 IU of pregnant mare serum hormone. Seventy sows served as controls, 124 injections with 2000 IU PMS were followed by 113 oestrus reactions, and 88 pregnancies, 16 injections with 1800 or 1500 IU by 11 instances of oestrus and six pregnancies. Oestrus occurred in 69 percent of the positive reactors on the fifth day after injection, the rest either earlier or later. The interval between the PMS injection and the onset of oestrus was similar to that between weaning and oestrus in the controls. Mean litter size and weight were not affected by different time intervals between farrowing and PMS injection, nor were there any significant differences in size and weight of litters at birth or at weaning at eight weeks of age between those of the treated sows and the controls. The use of PMS injection to shorten the farrowing interval had no effect on the size and weight of litters subsequently produced with or without hormone application.

* * *

POTASSIUM SALTS AND GERMINATION: Potassium has a 0-20-20 muriate based compound or as potassium sulphate with superphosphate was given to two sets of sandy loam in pots at potash rates of nil, 134, 267, 535 and 1069 lb K.O per acre, and the same nitrogen rate was given to all pots. At all rates tested the muriate based compound depressed the germination of lettuce seeds sown in the pots at about twice the rate of the other treatments. According to the report by M. A. Scaife in the Report of the National Vegetable Research Station, the salt concentration in the top inch of the muriate pots was about twice that in the sulphate pots, and this appeared to be the major depressing factor in germination.

* * *

LATE NITROGEN APPLICATION MAY PRODUCE POOR SILAGE: The experiment carried out in Northern Ireland has suggested that applying nitrogen before cutting grass for silage so as to speed the recovery of the aftermath could lead to poor quality silage. This work is reported in the Journal of the British Grassland Society, and the reason given is that the grass for silage will have taken up part of the nitrogen in the form of nitrate before being cut. This results in high pH levels in the clamp and poor fermentation. Molasses apparently had little effect on the pH of the control and low nitrogen herbage but at high nitrogen levels the silage improved with the addition of molasses.



What every farmer owes the apple

Remember Sir Isaac Newton? He had a little incident with an apple. And that's how we first discovered gravity.

Well now Lysaght is using gravity to help you eliminate manual labour. With their elevated grain silos.

The cone of the silos has been designed to ensure smooth, controlled flow emptying—with a lot of help from gravity and only a little from you.

Lysaght make a range of 12 elevated silos—from 260B—3700B—to store grain, seed grain, mash feed, poultry pellets. So they have something in store for you. Has the apple dropped?

Silos now 100% Tax Deductible in year of purchase.

Contact John Lysaght (Australia) Limited, Fabricated Products Division, Sydney, Newcastle, Melbourne, Brisbane, Adelaide, Perth, Hobart.

SPECIFICATIONS AND PRICES F.O.R. NEWCASTLE							
Silo Model	Capacity (Bushels)	Dia.	No. of Rings	Hopper Slope	Overall Height	Outlet Height above Gr. Level	Price
GPE1200	1200	14' 3"	3	30°	14' 9 1/2"	—	\$616
GPE2000	2000	14' 3"	6	30°	20' 9 1/2"	—	\$724
GPE3100	3100	19' 0"	5	30°	21' 6"	—	\$1092
GPE3700	3700	19' 0"	6	30°	23' 6"	—	\$1159
EMG275	275	7' 2"	3	60°	17' 0"	3' 6"	\$202
EMG550	550	9' 6"	3	60°	19' 6"	3' 6"	\$303
ESG260	260	7' 2"	3	45°	17' 0"	5' 3"	\$218
ESG330	330	7' 2"	4	45°	19' 0"	5' 3"	\$234
ESG390	390	9' 6"	2	45°	17' 6"	6' 0"	\$284
ESG510	510	9' 6"	3	45°	19' 6"	6' 0"	\$302
EPG330	330	7' 2"	4	45°	22' 6"	8' 9"	\$322
EPG510	510	9' 6"	3	45°	23' 0"	9' 6"	\$383

A range of flat floor general purpose silos from 200 to 3,700 bushels capacity is also available. An internal ladder is now standard in all GPE models.

Lysaght Elevated Silos

Australian and overseas Patents granted

S5503/1/N



SMALL COMPANIES DO WELL AT ORANGE

By COL BEGG

Some of the smaller companies showed the way in the New Implement Awards presented at the Australian National Field Days, Orange, NSW.

A TOTAL of 22 entries was accepted for judging in the 1969 New Implement Award of Merit competition at this year's Australian National Field Days. Out of these entries, 10 were given full awards and another five received certificates.

The majority of the awards were made to the smaller machinery companies and their inventors and manufacturers can feel justly proud. The standard was, again, very high.

Judges were Professor A. H. Willis, professor of mechanical engineering, University of NSW, Professor F. C. Crofts, professor of agronomy, University of Sydney, Glen Bowditch, lecturer in mechanical engineering, University of NSW and A. F. Sergeant, Belabula Farms, Canowindra, NSW.

The judging took place before the field days and COUNTRY was there to see the machinery and talk to

the judges. Unfortunately, we only saw a few items in practical demonstration but the potential of the others could easily be seen.

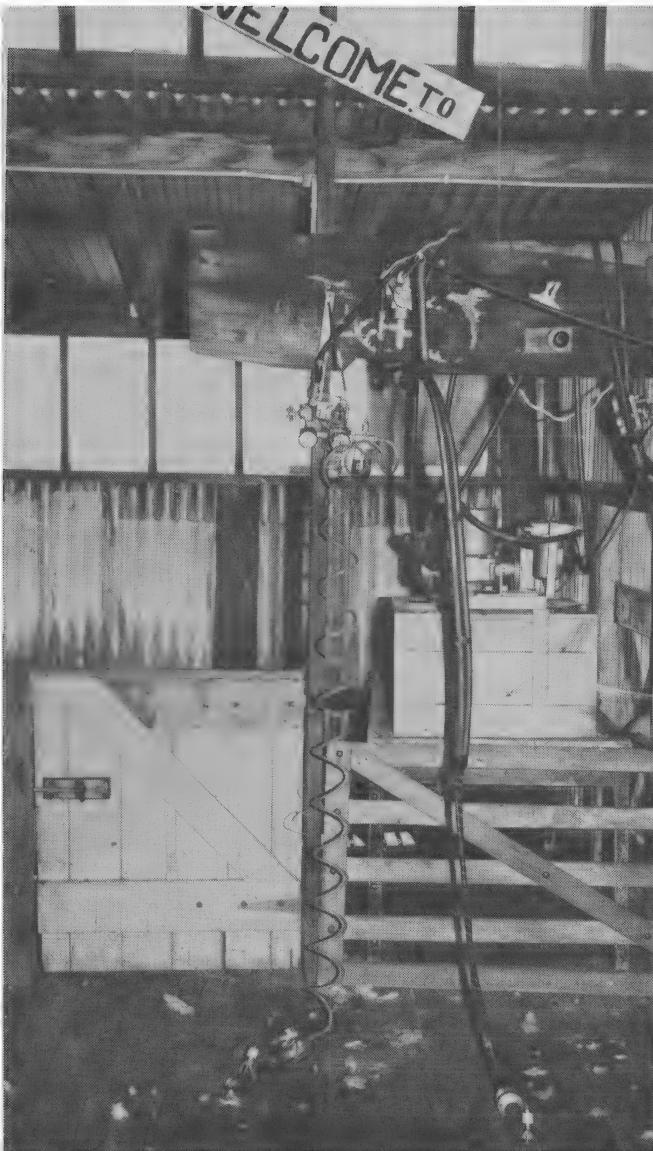
Although some of the entrants were a bit peeved that their equipment did not receive an award, I thought the judges did a very good job. The idea of the New Implement Awards is to help gain initial sales and publicity for new machinery and new innovations on existing machines.

Some of the entries were simply, very well designed and built versions of existing equipment. They were not sufficiently new in their concept to warrant an award. As the judges put it . . . "an insufficient breakthrough in this field".

This should not be taken as a rebuttal of a machine — nor should it discourage farmers from entering mach-

(Continued on page 21)

Pohlner's automatic stock feeder was one of the machines to receive an award of merit. It automatically mixes and trails out from one to four varieties of stock feed such as wheat, oats, barley, peas, stock pellets and nuts, with or without lime. The unit is towed with a tractor or utility and it is ground wheel powered through a gearbox. The hopper is constructed of sheet steel and is divided into four compartments. Heavy duty frame and wheel and tyre equipment allow for large loads.



Shearing handpieces came in for awards — the Able Star pneumatic shearing equipment taking out a full award. The handpiece weighs only 46 oz. and the comb, cutter and tension device are the conventional type. Power is supplied to a motor in the handpiece by a compressor. The torque developed by the motor is said to be sufficient to withstand double normal loadings. The speed range can be adjusted from zero to 10,000 cuts per minute without over-heating. Lubrication to all parts is automatic. A safety feature is that the handpiece auto-

matically shuts off if dropped or when placed down deliberately. This unit is shown above left.

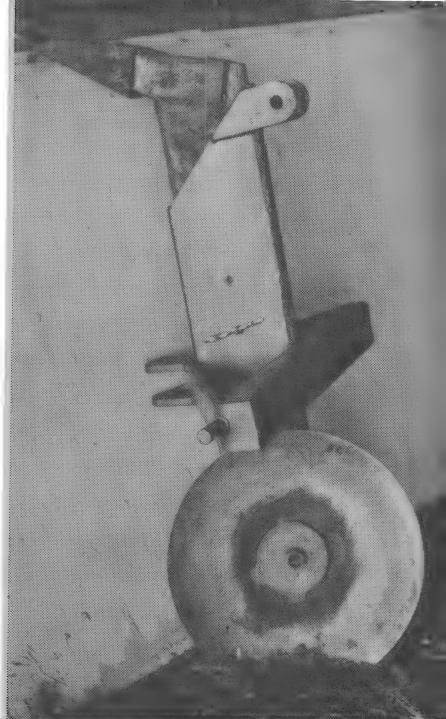
Another shearing handpiece given a full award was the Moffat-Virtue hydraulic type. Power is supplied by means of an engine driven hydraulic pump driving a small hydraulic motor on the end of the handpiece. The hydraulic oil is said to absorb heat from the handpiece to keep it cool and the in and out gear incorporates a safety by-pass valve so that if the handpiece strikes a piece of wire it will not jump out of the shearer's hands. Right above.



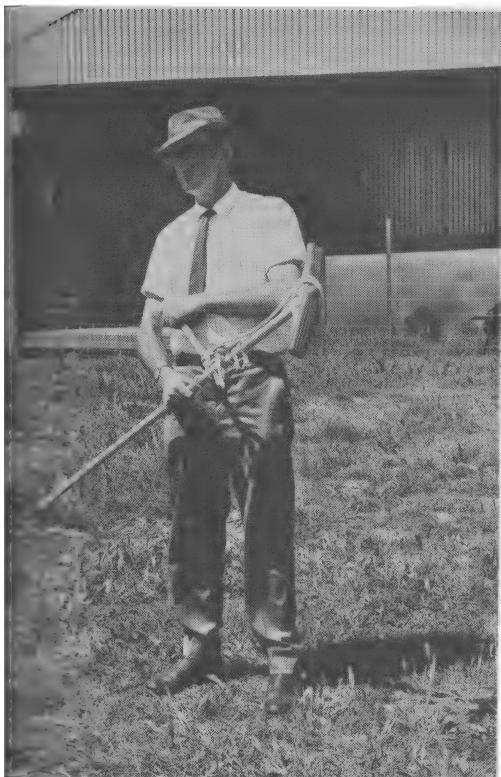
The Daken Corp took out their third award — a certificate — with the Tiki cattle cleaner. The unit is mounted on a cross frame for stability and has two rubbing bars which consist of a wire rope with solid aluminium elements to transfer the insecticide to the beast. Cattle rubbing on the elements cause the insecticide to travel down the wire and onto the elements. The cattle cleaner is used for the control of flies, lice and ticks. One unit is said to be capable of protecting 100 head of cattle. Shown at left.

* * *

Another Pohlner implement to gain a full award was the reversible point, three point linkage mounted, heavy duty ripper. This implement is fitted with a reversible leg for disc ripping or conventional ripping. Suitable for ripping soil, gravel, stumps, rabbit burrows, poison trails and drains, and very heavily constructed from plate steel.



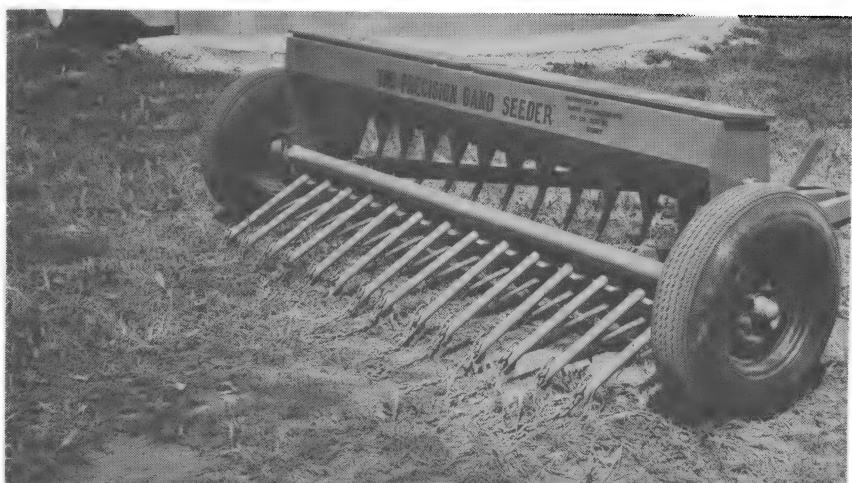
A full award was made to the Daken Corp for their HK calf saver. This device is designed to assist cows at difficult birth. Two cords are attached to the calf's forelegs above the fetlock and a ratchet and lever action enables one person to exert force at the same time as the cow strains. The implement is first worked from the left hand side then the right. In this fashion, it is said to be particularly helpful during the second phase of delivery.



Elders G-M were awarded a certificate for their Truline trailed post driver. This pto powered machine has a 12 ft 10 in. mast which angles 25 degrees left and right and 20 degrees back and forward and is capable of driving posts at 20 degrees in any direction. The monkey is raised and dropped by means of a jockey pulley running on twin V belts. The post driver will handle split hardwood, round pine, railway sleepers, RSJ, concrete, steel posts and piping. The frame also allows for transverse adjustment so that accurate positioning of the unit over the pilot hole is not essential. The mast is moved on the frame until it is in direct line with the pilot hole.

* * *

The Daken Corp also won a full award for their Tiki precision band seeder. This implement is of all steel construction with a vernier type adjustable drawbar for accurate positioning of seed in relation to fertiliser. Set at 7 in. spacings, the seed metering devices have 105 different settings enabling seeding rates of from $\frac{1}{2}$ lb of white clover seed up to 1.5 bush of oats or similar cereals. The unit will handle most tropical legumes seed.

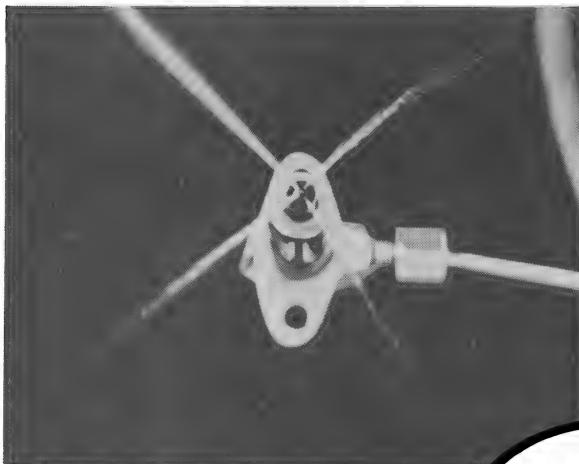


new money saver

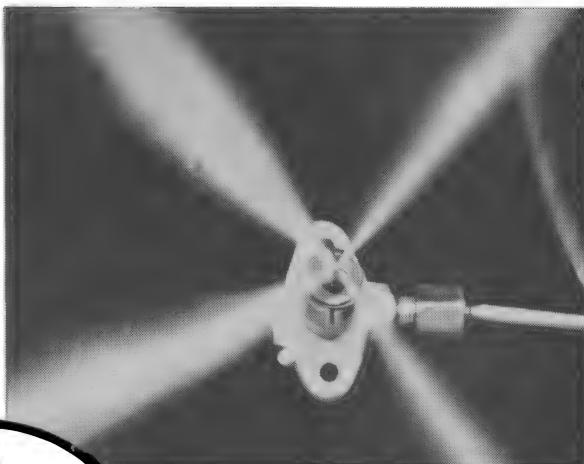
Caltex Superdiesel for all diesel engines

Caltex Superdiesel is a unique premium-grade all-purpose diesel fuel which exceeds the requirements of diesel engine manufacturers. It provides superior performance, higher power output, and improved economy in all types of diesel engines operating under a wide range of conditions.

Caltex Superdiesel is specially formulated to ensure that injectors remain clean and operating efficiently for long periods. Exhaust smoke is reduced. Fuel systems are protected against rust and corrosion, and the adverse effects of microbiological growth in fuel storage tanks are controlled.



This injector operated on ordinary distillate. Formations of lacquers and deposits have clogged the spray holes, reducing efficiency.



A properly operating injector correctly atomizing the fuel. Caltex Superdiesel keeps injectors operating efficiently.



Superdiesel

The Black River Pastoral Co. was awarded a certificate for their cattle crush. The all steel construction allows for operations including pregnancy testing, dehorning, drafting and many more. Full access to the beast is available through the top or bottom swinging gates of the crush. A heavy duty notched spear on the rear end of the crush allows for smaller animals to be held without difficulty. Overall length is 14 ft and weight is 12 cwt.

(Continued from page 19)

ines that they have built. Many men have made money from small beginnings -- take H. V. McKay for instance.

A good deal of machinery on the market today can and is being improved by farmers and graziers.

If you have an idea that comes into this category, it could be worth your while to take it to the company concerned — there's a very good chance that they will pay for useful improvements.

If you have any thoughts on manufacturing or marketing the item yourself, enter it in the New Implements Awards for 1970, it could be a good springboard for initial sales.

Equipment other than those reviewed here, included a full award to the Iplex Plastics company for their dripex irrigation system. A full report on this system appeared on page 30 of the September issue of COUNTRY.

A full award was made to Morehouse for their augeromatic feeder. It is a dust free cow feeder for herringbone bails.

Stanley Moore and Eildon Engineering also gained a full award for a trace element blender-dispenser for use with air blast fertiliser spreaders.

The field days could well be considered another success. Although the attendance seemed to be down — probably because of the wheat situation at the time — the genuine interest in the new machinery was evident.

Manufacturers fielded nearly 180 new machines and most major manufacturers were there — even if only represented by local agents or dealers.

A number of the trade people I spoke to were writing up business — so the field days are still serving a good purpose. □



Cyclone took out a certificate award for their heavy duty end strainer assembly. It is erected by driving the main post into the ground and attaching the stay by means of a galvanised bolt. Earth is removed to allow the plate on the end of the stay to be driven into the ground to a depth of 3 in. below ground level. The main post is then braced by driving tubular anchors through sleeves welded to the main post. The anchors are driven in at an angle and are a friction fit in the sleeves on the main post.

* * *

Geigy was one of the few big companies to receive a certificate award for an entry. Their's was the automatic on/off control for Spraysrite cattle spraying races. As cattle approach the race they knock against a "V" shaped control arm, switching on the spray. The spray automatically shuts off when the animal has passed through the machine, cutting down on chemical wastage and the problem of boggy yards. The "V" shaped trip makes it possible for all sized animals to pass through the race for treatment.



here's increased operating efficiency with less horsepower

And here's why. Specially designed spring pressure action ensures easy penetration in the hardest ground. Long low profile provides good trash clearance plus exceptional stability. The all-welded, carbon steel frame is completely enclosed (including wheels) for close working along fences and under trees. Forward mounted frame-anchored squat springs give wear-free life to rods and collars.

These are some of the reasons why this implement represents a dramatic advance in Scarifier design. If you think that's a strong statement, ask your Napier distributor to show you the many other reasons.

NAPIER STUMP JUMP SCARIFIER



NAPIER BROS. LIMITED Head Office: Dalby, Qld. Branch Office: Albury, N.S.W.



Prewett Industries' new equipment included the Allied 265 portable mill mixer. The tractor pto powered unit is fitted with an 18 in. wide intake conveyor for grain, ears of corn or hay bales and is capable of a throughput of 250 bu per hr of oats, 360 bu per hr sorghum, 360 bu per hr shell maize, 250 bu per hr ear maize, 0.5 bales of hay per min. Capable of mixing up to 1.5 tons of feed per batch and discharges to 11 ft high or down to ground level through the 6 in. diameter auger, which is mounted on the top of the mixing tank.



KBM Universal showed their four wheel drive conversion kit on the Massey-Ferguson stand, fitted to a M-F 178. It is also available for the M-F 165. The drive for the front wheels is taken off via a transfer box and through a drive shaft to the differential at the front axle. Drive can be disconnected by means of a lever at the transfer box and the tractor is lengthened by about 7 in. with the conversion. Conversion kits are available from KBM for about \$1860 or can be bought on new M-F tractors for about \$1400 extra on the price of the tractor.

NEW MACHINES AT THE NATIONAL FIELD DAYS

Colville Engineering demonstrated their new three point linkage mounted, pto driven pumps. Available in 6 in., 8 in., and 10 in. sizes of welded construction and extended on 6 ft long tubular steel linkage arms. The pump is self-priming when immersed to within 2 in. or 3 in. of the main bearings. Pumps can handle a 20 ft head and can be dropped 3 ft 6 in. below ground level and with a special extension, 6 ft below ground level. When running at 500 rpm, the 6 in. pump will deliver 1200 gpm, the 8 in. 2200 gpm and the 10 in. 3300 gpm.



Delta Plastics of New Zealand showed their new ear tags on the New Zealand Stand. The tags are suitable for all animals and are called monotag and duotag. They are fixed with single and double self piercing pins. Insertion is by means of a special pair of pliers and the tags are very flexible, like rubber, so that if they catch on an obstruction, they do not tear or damage the ear. Available in different colors with $\frac{1}{2}$ in. figures on the monotags and $1\frac{1}{2}$ in. on the duotags.

* * *

Flexon had a range of urethane floors, specially designed for the dairy industry. The floors are laid by mixing two ingredients and topping with aggregate if required. The demonstration blocks carried varying sizes of aggregate which, it is claimed, once mixed with the urethane, cannot be affected by acids and provides excellent abrasion resistance. Other characteristics of the floor are good impact resistance, will not support combustion, will not readily stain, has good flexibility and can be easily repaired with the same base material.



MURPHY

PROTECTS and CONTROLS FARM ENGINES . . .

MURPHY SWICHGAGES® are accurate, weather and vibration proof gauges that monitor when you are there and automatically protect your equipment when you're away. Over 4,000,000 in use.

IRRIGATION PLANT PROTECTION UNITS

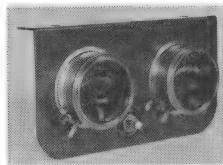


Water-cooled engines. Monitors and protects

- Oil pressure.
- Water temperature.
- Water pump pressure.

Air-cooled engines. Monitors and protects

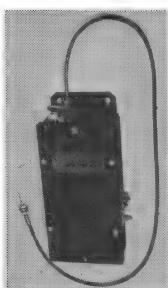
- Oil pressure.
- Water pump pressure.



TIME CLOCKS

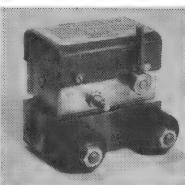
Shut down your irrigation plant automatically on pre-set time.

- 12T — 0-12 hours.
- 24T — 0-24 hours.



ENGINE SHUTDOWN RACK PULLER RP-20

- Pulls shut-off lever on signal from time clock or Swichgages.
- Easily mounted anywhere on engine.
- Flexible Bowden cable attaches to fuel rack.
- Electrical disconnect prevents battery drain.



FUEL SHUTOFF SOLENOID VALVE MV-7199

- Shuts off fuel on signal from time clock or Swichgages.
- Electrical disconnect after tripping.

Ask your dealer about . . .

MURPHY

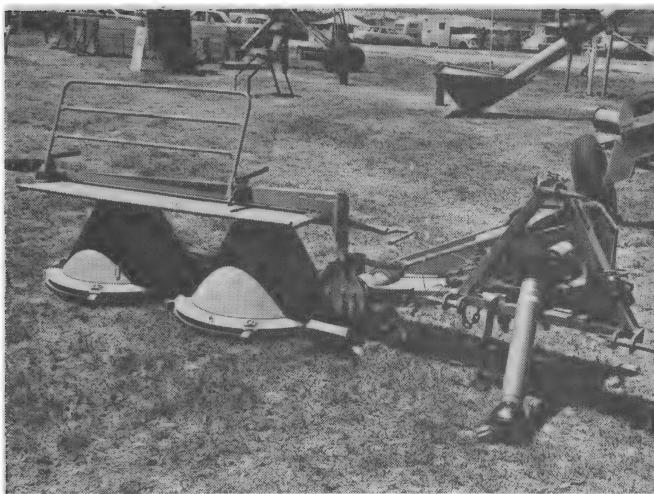
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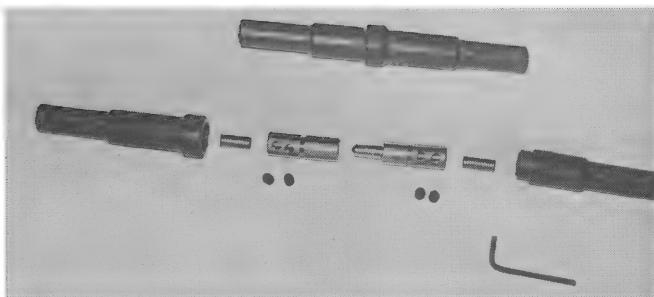
GILMAN & CO. (AUST.) PTY. LTD.
1 Alfred St., SYDNEY, N.S.W., 2000.
Phone: 27-4771.

NEW MACHINES AT THE NATIONAL FIELD DAYS

continued



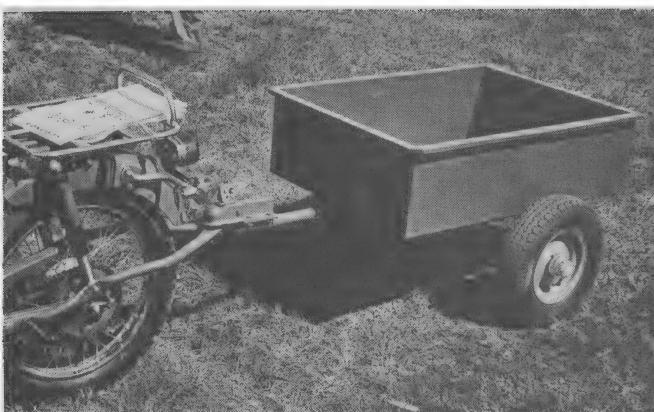
Delarue demonstrated their new rotary mower which uses two rotating cones as rotors. The blades of the fully offset rotors are driven from the bottom and once the crop is cut, the cones lay a windrow. The unit is tractor linkage mounted and pto powered and is available in 5 ft 3 in. and 6 ft 3 in. widths. The mower is designed so that it can be used on the side of embankments and other lower-than-horizontal work such as irrigation channel sides.



Lincoln demonstrated their new Mechconnector — designed for increasing the length of leads from a welder. The connector is designed so that no soldering is necessary. The cable is stripped, placed in the connector and tightened in by two grub screws. Heavy duty brass ends are protected by a rubber coat which slips over them. This connector is non breakable and can be used with safety on all applications. Cost quoted to us at the field days was \$4.75 each.

* * *

Bennett Honda demonstrated the Cubonda — a trailer designed to fit behind the Honda CT90 agricultural bike. The unit has a capacity of 1 cwt and measures 35 in. by 24 in. by 10 in. Wheel size is 4.00 by 8 in. and as the trailer is attached by means of a conventional tow ball, the trailer stays upright when cornering. The coupling is fitted with an over centre action quick release.





400 Series Combine Seed Drill

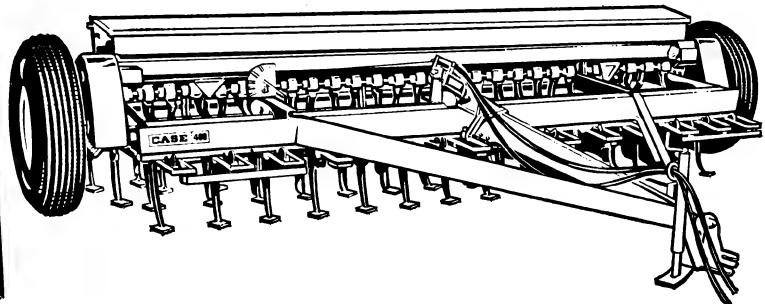
Precision planting—heavy-duty drive—rugged frame—exceptional Trash Handling Ability!

Simple Drives, Easy Maintenance, No Gear Boxes. Separate Drive to each side of the machine (double drives) halving drive load. Double Drives give more accurate sowing when cornering. Quick and easy sowing rate changes, fine adjustment. Two-stage hydraulic lift means that most clients will not need to buy special hydraulic cylinders. Two-stage hydraulic lift can be operated quickly and easily from tractor seat. Spring-loaded lids will not blow open or shut. Sealed lid hinges permit seed and super to be poured against lids for easy filling. Flat, strong lids can be walked on without damage. Large capacity seed and super box 926 lbs, seed and 1346 lbs super (for 28-run machine). Wide mouth hopper prevents bags jamming.

Lowest loading height—48". Easily removable super stars for cleaning. Tyne shape and lay-out give excellent trash clearance. All tynes jump a generous 15". Fixed floats give a level seed bed and excellent penetration. Tynes fitted with special long life removable bushes—no greasing. Special shape and boot arrangement ensure that seeds are placed uniformly on seed bed. Powerful spring release tynes. Simple maintenance, only seven grease points. Accurate, easy-to-read depth indicator. Precision acre-meter. Narrow tynes give light draft. Robust frame ensures long life. Precision seeders. All rubber conductor funnels, convolute hose and boots give reliable service.

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Here's a stock fence without barbs

. . . its points are
STRENGTH, LOW COST
and LONG LIFE

This fence doesn't need barbs to contain stock safely. Hickson's timber posts, droppers, strainers and rails with properly strained wire provide **all stock control** without stock damage. They're pressure impregnated with "Tanalith" or Creosote for permanent protection against decay, white ants and other pests. Hickson's uniformly graded round timber fence posts are stronger by far than any other posts: a 3"-4" diameter pine post will withstand a bending stress of up to 5,500 ft. lb.—

compare this with the strength of other types of materials. They're easier to transport, handle, erect and staple, too, with multi-grooved droppers for easy running of wires . . . and OUTLAST all other fencing materials. See your local Stock & Station Agent or send the coupon . . . he's got the right answers to your fencing problems.



SEND THIS COUPON TO YOUR LOCAL STOCK & STATION AGENT

Please send me informative literature and prices on
Hickson's Preservative Impregnated Fencing Timbers.
AC170

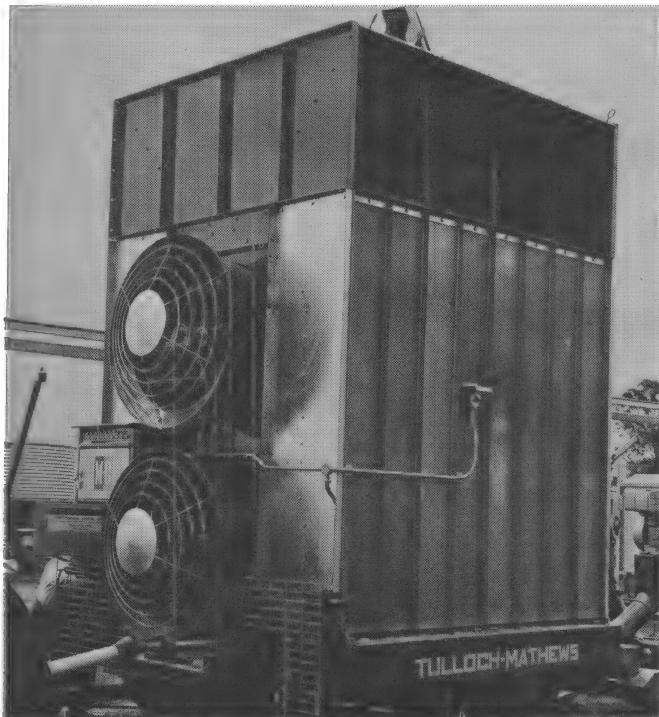
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Pty. Ltd. P.O. Box 252, North Sydney, N.S.W. 2060

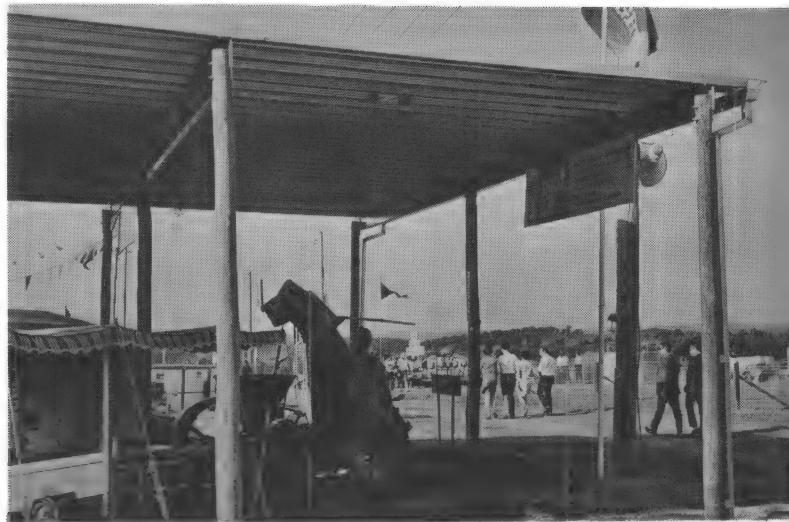
HT/229



Tulloch displayed one of the biggest pieces of new machinery at the Field days. It is their M-C-Tulloch continuous grain dryer. Two models are available — a pto powered or an electric drive, with either liquid petroleum gas or natural gas heating. The fully automatic unit controls the rate grain travels through it and the numerous safety devices ensure the sample is not damaged by overheating. The model pictured is capable of reducing the moisture content of sorghum five percent at a rate of four tons per hour. Suitable for all grains, cereals and seeds. Unit shown costs about \$6300, and is fully transportable.

NEW MACHINES AT THE NATIONAL FIELD DAYS continued

John Lysaght displayed their new roof kit. This building is designed for do-it-yourself building and consists of roof panels, purlins and if required, guttering and downpipes. Designed for use as a hay shed, machinery shelter, temporary feed, fuel and fertiliser dump, truck port and many other uses. The unit on display was erected on treated wooden poles, which can be 12 ft, 15 ft or 18 ft high. Bay sizes are 17 ft by 25 ft, which can be added to without bracings being needed. Price for the kit for a two bay shed as illustrated, without poles is \$370 FOR Newcastle, NSW.

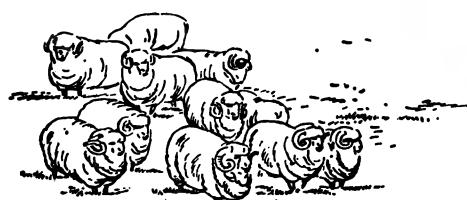


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PROVIDES EFFICIENT RELIABLE TWO-WAY COMMUNICATION

AWA Teleradio 60A/B brings the advantages of direct communication to isolated areas, providing a convenient and sometimes vital means of sending and receiving spoken messages. A worthy successor to the famous Teleradio 5A. the AWA Teleradio 60A/B employs the latest transistor techniques for input power economy and reliability, with increased transmitter output.

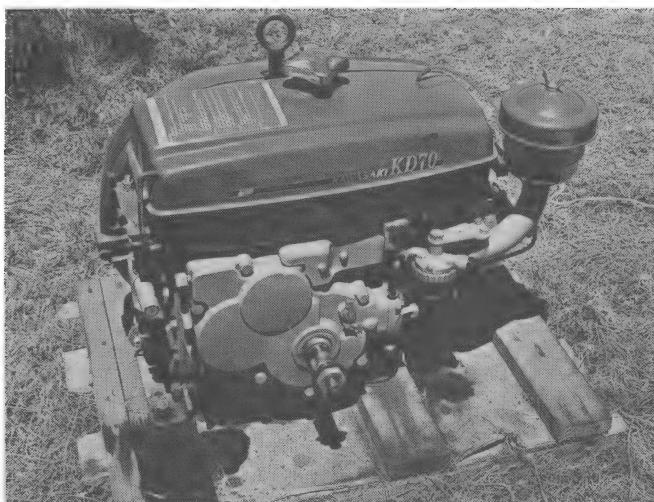


For further particulars please contact

AMALGAMATED WIRELESS (AUSTRALASIA) LTD

Engineering Products Division

422 LANE COVE ROAD, NORTH RYDE, N.S.W. 88 6666



Kawasaki-Davleco showed their range of engines and pumps. The Kawasaki KD70 is a multi-purpose diesel engine, which develops a maximum of 7 hp at 1400 rpm and a continuous output of 5.5 hp. It is an air cooled, four stroke type with a single horizontal cylinder. It is fitted with a mechanical governor. Price for the standard unit f.o.r. capital cities is \$380, fitted with handy lifting eye.



R and N Buildings displayed their Bulkmaster all steel grain shed. This unit can be used off season, for a variety of applications including machinery shed, hay shed, general purpose storage. The end walls and doors of the building are heavily braced to withstand pressure from the grain. Doors are hinged to open a 24 ft wide entry. A variety of optional equipment can be had with the different sized sheds to make them suitable for a particular application.



Capitol Motors also showed their new Russian made tractors at the field days. Two models were on display. The T40A is a 40 hp, four wheel drive tractor fitted with a four cylinder four stroke diesel engine and six forward speed gearbox. The tractors give the appearance of being solidly built and have a number of features, including front suspension, cab and side and rear pto shafts.



AMI showed the new Zetor 8011 Aristocrat which develops 80 hp at the engine crankshaft and 70 hp at the pto. The four cylinder engine drives through 16 forward gears and eight reverse. Tyres fitted are 7.50 by 16 on the front and 15/18.4 by 34 on the rear. Overall length is 12 ft 11 in., width 73 in., height 71.8 in., ground clearance 16 in. Two speed pto is fitted and category two linkage is standard with a lifting capacity at the hitch points of 3748 lb. Optional extras for the 8011 include fully enclosed cab, air pressure trailer brakes.



Stead and Baker created a lot of interest with their SR Combine Grain Monitor. This unit consists of two sensing plates which are placed one at the end of the sieves and one at the end of the straw walkers. When grain is passed over the end of the walkers or the sieves, it strikes the sensing plates and registers on a control panel in front of the operator. Separate readings can be obtained for both the sieves and walkers and one kernel is enough to register on the meter. On demonstration, it was shown that trash will not move the needle.

FIRST RELEASE!! OF THE NEW

CAPTRAC 2 & 4 Wheel Drive Tractors AT Orange National Field Days



Special features:

Captrac MTZ 52, MTZ 50 (left)

65 H.P. 2 and 4 wheel drive.

- Four stroke, four cylinder, water cooled diesel engine.
- Differential lock.
- Front, rear and side P.T.O. shafts.
- Fully enclosed metal cab.
- Hydraulic shock absorbers on driver's seat.

Prices:

MTZ 50, \$3,550; MTZ 52, \$4,400

Captrac T 40 A (below)

Special features include:

- Four wheel drive.
- Four stroke, four cylinder air-cooled, direct injection diesel — produces 47 H.P. at 1600 R.P.M.
- Seven forward speeds ranging from 1.62 M.P.H. to 26.68 M.P.H.
- Rear and side P.T.O. shafts.
- Belt pulley.
- Front suspension.

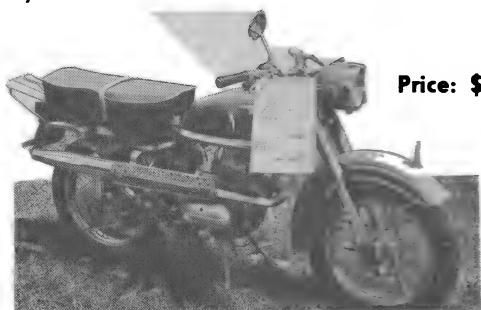
Price: \$3,700.

NEW MOTOR CYCLES

VOSKHOD 175 shown with a "welcome Jabiru" award presented at Orange.

Single cylinder two stroke 173.7 cc. 10 H.P. — 3.25 x 16" tyres — available with front knee guards and wind shield — excellent dust protection for engine — suitable for rugged country use.

Fully enclosed oil bath drive chain.

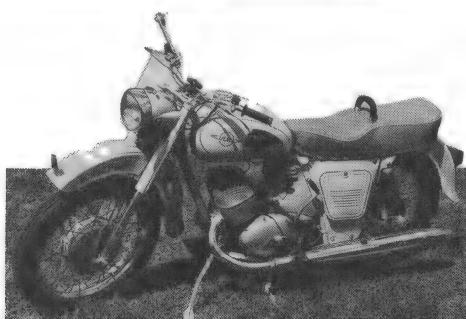


Price: \$375 + tax.



JUPITER 350 Two cylinder, two stroke, 347 cc. engine 19 H.P. — Four speed gearbox — rugged tubular frame construction — telescopic, hydraulic, front shock absorbers — 3.25 x 19" tyres — pillion seat excellent dust protection for engine. Fully enclosed oil bath drive chain.

Price \$470 + tax.



Australian Distributors of Tractors and Agricultural Bikes

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100 Parramatta Road, Auburn.

Mr. Reg Johnstone of Capitol Motors would be pleased to forward further details.

All enquiries for State Distributors and dealers welcome.

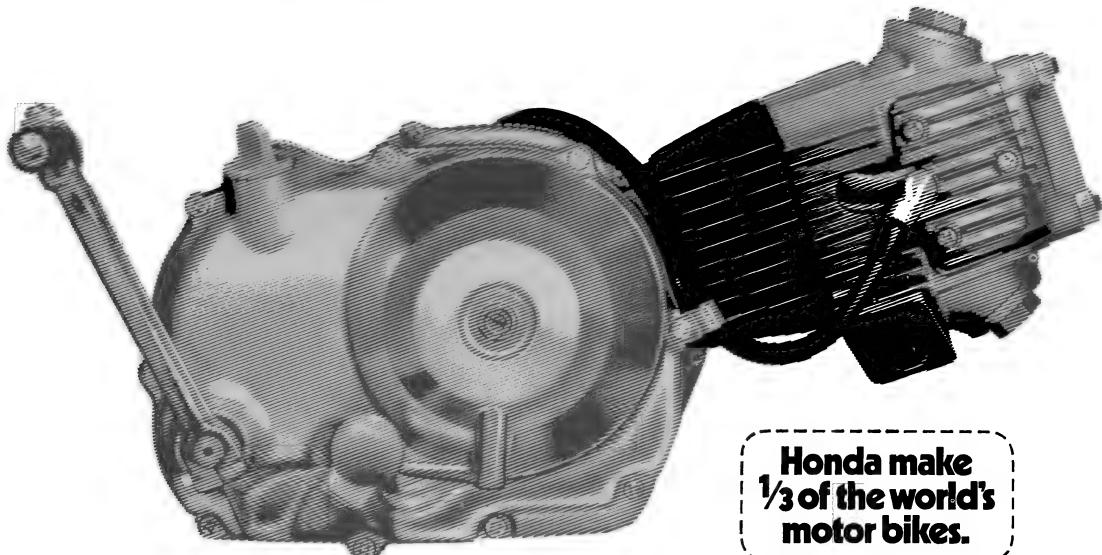
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Honda make
**1/3 of the world's
motor bikes.**

**Honda 4-stroke power is packed
with these important advantages:**

- NO OVERHEATING — even in hot weather.**
- NO DIRTY SMOKE — minimum fumes and carbon deposits.**
- NO UNPLEASANT NOISE — just 'hush power'.**
- NO POWER LOSS — more flexible and economical.**
- NO DIFFICULTY IN STARTING — even in cold weather.**



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HONDA MOTOR CO. LTD., TOKYO, JAPAN.

COUNTRY REPORTS

Welcome to a new feature for Australian COUNTRY Magazine. "Country Reports" will each month bring you those items of interest gleaned from at home and abroad — information that will help keep you abreast of new developments, ideas, happenings.

UNITY GROWS

Talk of "grower unity" had been around for so long that one got rather tired of hearing the phrase and seeing little done — until the past couple of years brought a spate of rationalisation: in Victoria, in South Australia, in NSW. It culminated in the APPU-NFU Federal merger of a few months back.

But the process is still going on, in NSW at least. Latest moves are between the Milk Zone Dairymen's Union, Primary Producers' Union and the United Farmers and Wool-growers' Association. Things seem well on the way to one voice for the NSW dairyfarmers, probably speaking as a division from the now huge UFWA umbrella.

RED WOOL

With winter hard on them again, Russians must have at last got the message about "red wool next to the skin". The IWS has been at work there for some time and, coupled with a 9 percent cut in sheep and goat numbers last financial year, the Russian buyers are expected to be back in the Australian market shortly.

F and G senior wool valuer, Jim Brassil, made the forecast recently, adding that big quantities of wool suitable for the Russian trade would be on the market soon. He said they were after a good style 60-64s free or nearly free of vegetable fault.

BRIGALOW RESERVE

Good news for all conservationists — and what farmer and grazier is not a conservationist at heart, despite what the city people say. Queensland's Minister for Lands, V. B. Sullivan, has announced the dedication of 27,420 acres of brigalow land, 15 miles south of Nebo, as a national park.

With a 13 mile frontage to Bee Creek, the park contains extensive areas subject to periodic flooding, has large permanent lagoons well away from the main watercourse, and there is "a prolific representation of wildlife including waterbirds, kangaroos and emus," Sullivan reports.

PROs TAKE NOTE!

A cry from the heart of NSW *Country Life*'s associate editor Col McCarthy echoes into COUNTRY's columns:

"Public relations officers engaged by departments, commercial houses and industrial organisations are notified that unless their contributions are written and presented in proper newspaper style in future they will be immediately consigned to the WPB."

Hear, hear. COUNTRY is always interested to hear of new products, policies or ideas, but some of the stuff that comes our way from pseudo professionals is a downright disgrace, from a technical point of view . . . to say nothing of a waste of their client's, or taxpayers', money.

CAMBODIAN MILK PLANT

The Australian Dairy Produce Board's latest venture into the Asian milk market should come on stream by the end of January. It is the Sokilait company plant at Phnom Penh in Cambodia, and it will produce sweetened condensed milk for the country's 6.5m people.

Apart from the board, the Royal Cambodian Government and private local shareholders have a stake in the new business.

LUPINS IN THE EAST

With things the way they are for wheat, a brand new crop being tried in southern NSW is creating more than passing interest.

Lupins have been used with great success in WA for years, but somehow they have never caught on in the east. It is claimed that using WA developed varieties, such as University White, the crop can be produced as cheaply as wheat and in areas which may be too dry for cereals.

Milers looking for a source of high protein feeds have shown interest in the NSW crops.

CATFISH FARMING

A US Bureau of Sport Fisheries and Wildlife report tells of 700 catfish farms, involving 30,000 acres of farm ponds, producing 39m market size fish and 50m fingerlings worth \$10.5m a year. That's a yield of \$350 an acre gross. Worth thinking about, isn't it?

PERFORMING POLL DORSETS

John C. Garnock's South Bukalong Hereford and Poll Herefords have really made their mark through performance testing backed by top management and selection. Now the station's Poll Dorsets have been added to the performance testing program.

Lambs from the 1968 drop from 500 stud ewes were weighed at birth, 80 days and six months in a program under the supervision of the University of NSW school of wool and pastoral sciences.

Well known stud man Bill Jonker told COUNTRY that Garnock hopes to have "sufficient data available for all sires used in the stud in the near future".

WELCOME TO URUGUAY

From July 1 South Africa, New Zealand and Australia will have a new partner in the fight for wool around the world. On that day the Uruguay Wool Secretariat, based in Montevideo, will start to promote Woolmark, will contribute to world IWS promotion funds, and will have a seat on the IWS board.

Wool, by the way, makes up about half the country's export income.

MAIZE MONSTER ON TABLELANDS

For the first time demonstrated in the Far North of Qld, a four row corn picker that picks, shells and loads maize is being demonstrated on the Atherton Tableland. Until comparatively recently, maize was picked by hand, carted to a barn, then loaded again and sent to the Atherton Maize Marketing Board which shelled and dried maize. The new machine — an MF 510 self propelled header fitted with a four row picker — is quite compact and has no power line problems. It takes one man only two or three minutes to fit a header for grains other than maize. Glycine and sirato legume seeds may be harvested this way, also grass seeds.

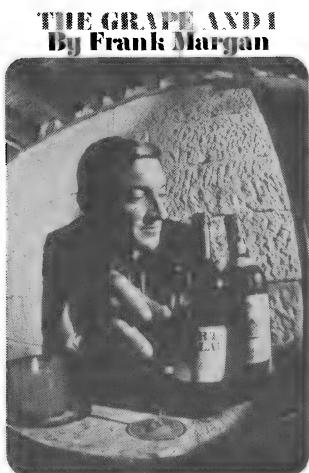
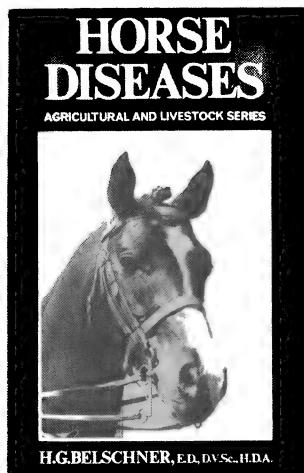


COUNTRY LOOKS AT BOOKS

Another excellent animal health book has just come off the press written by H. G. Belschner. This time the subject is horses.

Belschner deals with just about every disease and ailment pertaining to horses in the 258 page book, with practical diagnosis and treatment for the beginner and the old hand. A comprehensive index at the back of the book provides cross indexing of diseases so that colloquialisms are not a problem. "Horse Diseases", a hard bound book, is published by Angus and Robertson at \$9.50.

—S.B.



Wine is for getting drunk and singing songs on . . . explains the dust jacket on one of the most light-hearted yet authoritative books on the Australian wine industry I have ever read.

The author, Frank Margan, has in this book explained in layman terms many of the processes that have been the knowledge of only the wine buffs up to date. He is perhaps more responsible than anyone for the tremendous growing interest being shown in Australian wines as he was public relations manager for the wine industry for some years.

The book travels throughout the wine growing areas of Australia, exploring what types of wines come from the particular vineyards, their quality and a little history of the area. Humor also plays an important role in the make up of the book—Margan's dry wit coming to the fore with items such as the pressing of a vintage by the time honored method of treading the juice from the grapes, while Max Lake played "Zorba the Greek" on a piano in the winery.

A truly entertaining and informative book—"The Grape and I", by Frank Margan, is a hard-cover book published by Paul Hamlyn at \$1.95.

—C.B.

* * *

For the children—a delightful book of bush stories set on a Tasmanian farm—Powranna to be exact.

The book is a sequel to Nairda Lyne's stories published under the title Tasmanian Tales. The same children carry on their adventures — helped by such assorted friends as Percy Pigeon, who has a fixation about ending up as a pigeon pie. Happy sketches by the author tie the stories together. "Adventures at Powranna", by Nairda Lyne, hard-cover, published by Fuller's Bookshop at \$2.45.

How wide is your knowledge of the vernacular as encountered around the seamy side of Sydney? Perhaps like me, you have always thought that in the idiom, a john was a policeman?

Wilda Moxham, in her determination to establish a total identity between the reader and "The Apprentice", uses the unusual device of recounting the whole story, thoughts, actions and dialogue, in the idiom of her main character,

Rufe. She has done her research well and the result is a novel with an authentic ring.

Rufus Stanley Dale had plans to become a burglar—he was a handy size for agility, had the right kind of tutors and could make convincing play with his flick knife. But luck and his easily identifiable red hair were against him and while still an undersized teenager, he makes his bow to the reading public via the delinquents' court, to become an unwilling apprentice, indentured to a NSW racing stable.

I found myself exploring a fresh facet of life through his idiomistic tongue. I responded with understanding to the rough, tough moulding of a character in an environment which alternated between bikies, birds, hotrods, dope pedlars and tippers during the evenings off duty and steaming manure heaps, race track routines, immature apprentices and princely thoroughbreds under the rigid discipline of the stables. Much information on the training of racehorses has been used by the author to provide authentic color to the background of the story.

The book is bound in hard covers and is published by Rigby at \$3.50.

—E.K.

* * *

Is it going to rain next month? . . . will wool prices rise or fall? . . . how much fodder should be stored? . . . what happens if? . . . Farmers and graziers all ask themselves these questions: some get the right answers, some don't—and most fall in between.

As a move towards helping the farmer come up with the right decision for his situation a number of valuable guidebooks have been produced by the farm management department of New England University, Armidale, NSW.

Recently P. A. Rickards, the department chief, sent me for review a half dozen copies of the major guides.

Some of the titles are aimed specifically at the farm accountant, others at the professional farm advisor. However, the explanations are good, clear and concise and the average farmer, who is not afraid to do a bit of furious calculating with pencil and paper, could put most of the material in the books to profitable use.

To me the best of the books is No 6—Best-Bet Farm Decisions, by J. P. Makeham, A. N. Halter and John L. Dillon.

A warning: Don't try leafing through the booklet before you read it, for almost inevitably you will be put off by the formulas and equations that leap out of the pages.

If, however, you start at the front of the book, the arguments and development of the equations are worked up fairly simply and become quite clear.

By page 28 the book is showing how to work on such vital issues as how much fertiliser to use, whether to buy a stud or herd bull, what size fodder reserve to use and whether to buy stock exchange shares or more wethers.

The book's introduction makes it very clear that by following its advice farmers are NOT guaranteed the best possible decision will be made.

"All our procedures guarantee is the best possible decision before the dice are rolled," it said.

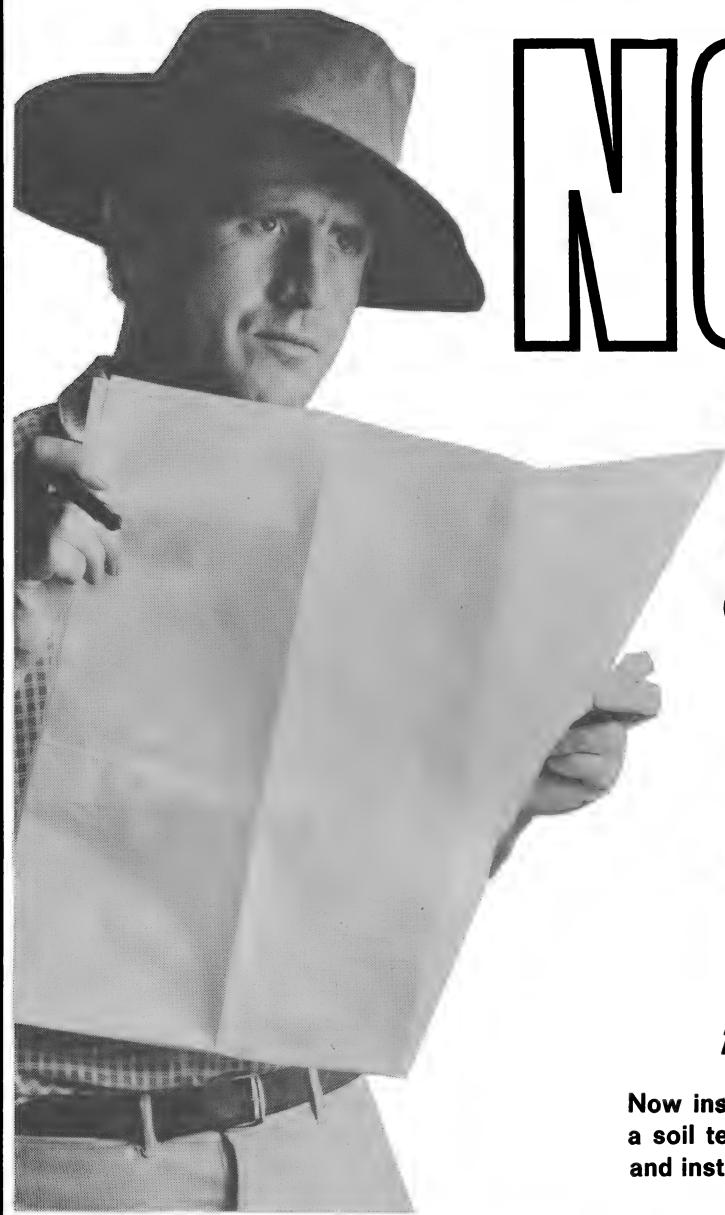
"We do not guarantee that the results of the decision will be necessarily 'good'. If a poor result should occur, we would say the result was 'bad', not the decision."

"As mere mortals, we have to be satisfied with optimal decisions before the event, without any guarantee of having no regrets after the results are known." (The double negative is the university's, not mine.)

This style of writing is fairly typical of the whole book—reasonably easy to read. But it's no book to read while the TV commercials are on either, for it does require concentration and care to get the most from "Best-Bet Farm Decisions".

In all, these books in the Professional Farm Management Guide Book series are a vital contribution to better and more profitable primary production. Some require a fairly high education standard to be of major value—others could be applied by the average producer who can keep a fair set of farm books. They sell at \$1.50 each.

—G.M.



NOW!

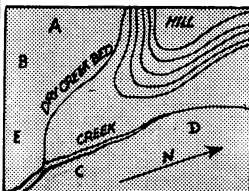
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Follow the printed instructions. First size up the area noting soil types, slope, erosion, drainage.



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WHEN TO SELL BEEF

By
GEOF MURRAY

Most people would like to know when to buy and sell their stock at best prices. This report is a guide to when the optimum market prices occur.

ANYONE in business has the same basic outlook on life — to buy cheap and sell dear. In primary industry this applies just as much as in other fields . . . ask 99.9 percent of our pastoral millionaires.

It is a very different thing to put the simple rule into practice . . . ask any pastoralist, including our 99.9 percent millionaire group.

Most successful producers have an idea when the market should improve, and when it is at its worst, during the year. Production is planned as far as possible to get stock on to the market when it is at its best.

But the question remains — exactly, when is stock likely to be most expensive, and when are they cheapest?

A study into this question at leading markets is being carried out by the Bureau of Agricultural Economics for the Australian Meat Research Committee.

A hint of things to come from this study was given in the recent BAE report "Fattening Store Cattle by Drylot Feeding" (See this issue, page 26).

The drylot report gave a table from the markets study which showed the pattern of prices over time in the capital city stock markets of

Midland Junction, WA, Gepps Cross, SA, Cannon Hill, Qld, Newmarket, Vic, and Homebush, NSW.

By and large, these markets set the prices for the various States. Local factors of course do affect sales in country yards.

The study over a number of years by the BAE showed a definite pattern in the sales month in the various major centres.

Far from the expected situation where the best prices would fall in mid-winter, the study showed that peak prices ranged from May through until December, according to the State.

Prices started to reach their best point of the year in May in Perth, while Brisbane's top market month was December. The market

peaks tend to move from west to east — Perth, Adelaide, Melbourne, Sydney, Brisbane.

November and December were the worst market months in Perth and Adelaide, December and January for Melbourne, March and April in Sydney and May for Brisbane . . . again a west to east movement.

These movements are shown in the graph on this page. They were taken out on 650-700 lb dressed weight for first and second export quality ox and heifer beef.

The best time, on average, to sell stock is shown on these pages, but expert advice on spot market conditions must be obtained from operators like this Dalgety team at Dandenong yards in Victoria.



BAE research showed that the markets for heavier and lighter cattle varied from month to month in much the same way as for the stock graphed.

Commenting on the work, BAE said, "It should be realised that the actual change in prices experienced may vary from the expected prices owing to such things as within month price changes, long term trends, or unexplained irregular movements.

"Nevertheless, over a period of years the average change in price between months has closely approached that shown . . ."

What do the figures mean — those on the graph and those in the table? The figures are monthly prices shown as percentages of 12 month moving average prices. The 100 percent line represents the year's average.

Take the Midland Junction market, for example. In June the market prices should be 14 percent above the year's average, while in November they should be 10.7 percent below that average.

Very interesting — but how can the figures be applied in practice?

An estimate of the expected sale price can be made by taking the price per 100 lb dressed weight of store stock at purchase and dividing it by the percentage in the table for the month and market of purchase, and multiplying this result by the percentage for the month and market of sale.

Say store cattle were bought at Homebush in June for \$25 per 100 lb and were sold in the same market in September. Divide \$25 by 100.6 and multiply by 105.1 to give an answer of \$26.12 per 100 lb.

In other words, during the three months the usual movement in seasonal prices has added \$1.12 per 100 lb to the beast's value.

The graph and the table should be of more than academic interest to beef men wanting to make the most of playing the market — provided they always keep in mind the short term factors which can affect calculations.

When it is published the full report on this study by BAE, supported by the Australian Meat Research Committee, should make even more interesting reading. □

BEEF PRICE MOVEMENTS

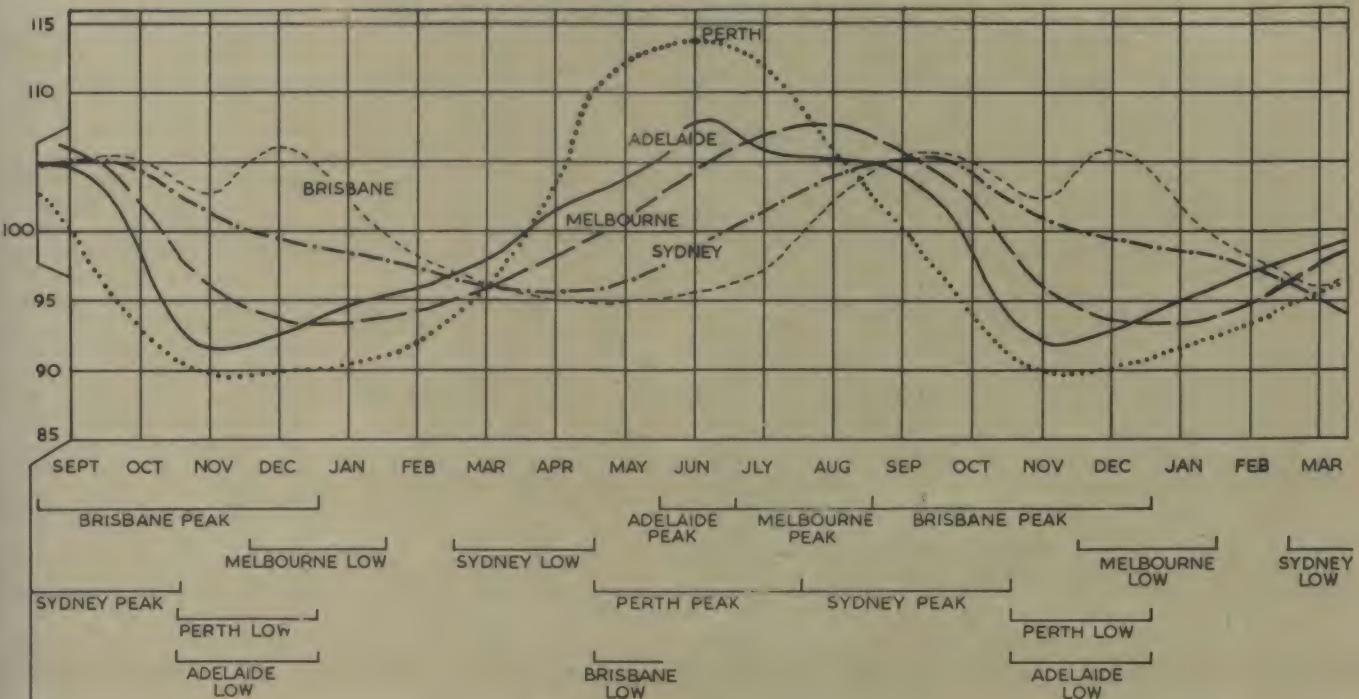
Month	Home-bush	New-market	Cannon Hill	Gepps Cross	Mid-land Junc'n
	%	%	%	%	%
Jan.	98.6	93.2	101.8	94.8	91.8
Feb.	97.5	94.6	98.0	97.1	91.8
March	95.6	97.4	95.8	97.4	96.0
April	95.3	98.1	95.0	102.1	103.8
May	96.2	100.5	94.4	102.8	112.4
June	100.6	104.4	96.9	108.1	114.0
July	101.6	107.2	96.7	105.4	112.4
August	104.5	107.9	101.8	104.9	105.4
Sept.	105.1	105.7	105.8	105.1	100.0
Oct.	105.0	102.1	105.1	98.2	93.4
Nov.	100.6	95.7	102.6	91.7	89.3
Dec.	99.7	93.3	106.0	92.7	90.1

To find the expected sale price of stock bought in any month take the price per 100 lb dressed weight, multiply by the percentage factor from the table for the month and market on which the stock should be sold and divide by the percentage factor for the month and market on which the stock were bought. Take a store beast bought for \$25 per 100 lb at Homebush in June and sold in the same market in September:

$$\frac{\$25 \times 105.1}{100.6} = \$26.12 \text{ per 100 lb: a gain of } \$1.12 \text{ in three months.}$$

If the stock have to be held over for some reason until December, then:

$$\frac{\$25 \times 99.7}{100.6} = \$24.88 \text{ per 100 lb: a loss of } \$0.12 \text{ in six months.}$$



MEET OUR BEST CUSTOMER



PROFILE OF OUR BEST CUSTOMER

Product	Best Customer		Japan		Total export value \$000
	Country	value \$000	value \$000	place	
Beef: bone-in boneless	USA	1,782	250	4	3,046
Lamb cuts	USA	169,873	9,680	2	204,395
Mutton: carcass cuts	USA	4,130	116	6	7,960
Pig meats	Japan	2,008	2,008	1	6,136
Edible Offal	USA	9,600	6,490	2	26,104
Dairy Products:					
skim, spray, dry butter conc.	Philippines	1,712	472	3	6,024
cheddar cheese	Thailand	1,159	139	7	4,633
other cheese	Japan	2,997	2,997	1	5,442
Casein	Philippines	1,239	322	3	2,427
Lactic	USA	4,447	2,694	2	7,978
Rennet	USA	512	391	2	1,458
Other	Japan	196	196	1	379
Eggs: liquid	Japan	416	416	1	1,053
Wheat	Japan	62,435	62,435	1	258,417
Barley	UK	5,573	5,550	2	18,242
Oats	W. Germany	3,328	2,441	3	13,031
Sorghum	Japan	2,957	2,957	1	2,967
Malt	Japan	3,381	3,381	1	7,659
Raisins	UK	313	134	4	1,058
Sultanas	Canada	5,639	292	8	17,117
Peaches	UK	7,719	123	11	14,531
Sugar: raw refined	UK	39,185	23,482	3	116,233
Molasses	Okinawa	16,021	819	3	5,974
Other sugars	USA	2,634	443	2	3,308
Cocoa	Japan	2,089	2,089	1	2,098
Chocolate	Japan	139	139	1	158
Stock feed:					
Lucerne meal	Japan	232	232	1	255
Meat meal	Japan	1,137	1,137	1	2,715
Milk powder	Japan	505	505	1	1,445
Hides: cattle					
dry salt	Italy	443	286	2	818
wet salt	Japan	5,250	5,250	1	12,986
horse	Japan	117	117	1	138
other	Japan	2,084	2,084	1	3,065
sheep skins	France	4,088	452	6	9,760
kangaroo	USA	636	112	4	1,213
Linseed	Japan	424	424	1	424
Cotton seed	Japan	395	395	1	399
Wool:					
greasy	Japan	261,352	261,352	1	717,963
slip	UK	546	113	6	1,922
scored	USA	10,572	356	14	40,431
skin	Italy	461	138	2	811
carbonised	Hong Kong	2,071	1,518	2	10,000
tops	Hong Kong	5,949	132	20	22,684
Cotton	Japan	917	917	1	1,890
Beef tallow:					
edible	Japan	806	806	1	1,305
inedible	Japan	395	301	1	1,124
other	Netherlands	1,523	26	3	7,687

Japan has grown rapidly as a market for our farm products. This report tells how agriculture has developed in Japan, and how it is now organised: vital information for anyone assessing the future prospects for trade with our largest customer.

By HIDEO ISHIKAWA*

THE Islands of Japan — crowded with some 100m people — extend from 46 N to 25 N, northeast of the Asian Continent. This geographical situation makes it possible for the country to take up various types of farming:

- The north European type in Hokkaido, her northernmost island, and
- The subtropical type in Ryukyu Islands in the southern extremity.

Japanese agriculture as a whole represents the temperate type of farming. There are 14.6m acres of cultivated land, made up of 8.5m acres of lowland and 6.1m acres of upland, which are divided among 5.4m farm households with the average holding of 2.47 acres per household.

Of all the physical conditions most important to Japanese agriculture, mention should be made, first of all, of the climate which is considerably affected by the monsoon. Under this climatic condition, the annual average rainfall amounts to around 60 in.

Secondly, Japan is mostly occupied by mountains and slopes, leaving only 16 percent of the total land area for cultivation. On deltas of some rivers, large cities — such as Tokyo with its huge population of 10 m, Osaka and Nagoya — have developed.

On a narrow and flat coastal belt along the Pacific Ocean, Tokyo, Nagoya and Osaka together with other large and small cities form a megalopolis where 50 percent of total population have their homes.

Agriculture in Japan is mainly carried on in a

rather small area between mountains and slopes, and the cities and towns.

The topographical condition demands a higher land productivity for agriculture, which therefore has been forced to take up rice as the most important crop responding to the demand. Climatic conditions under the monsoon also helps the high productivity from rice.

Rice, the staple food for the Japanese people, accounts for 46 percent by value of total agriculture production. Thus it can be said that rice production and prices are most important among the various agricultural problems in Japan.

Japan entered in the modern capitalistic age only 100 years ago. During the century since then, Japan's agriculture was affected in a major way by three events: the Meiji Restoration in 1868, the land reform immediately after World War II and the high paced economic growth lasting from 1955 to date.

The Meiji Restoration abolished the feudal tenure and legalised private land ownership. Eventually, however, it could not establish a tenure system based on owner-farmers, as seen in the western Europe, but did set up a landlord system.

The landholding system under landlordism and the petty farm management, provided the economic foundation on which capitalism in Japan could become fully fledged.

Further land reform was implemented after World War II and gave a significant effect on agricultural development in Japan. Some 5 m acres, or 30 percent of the total cultivated area, was released from the hands of landlords to operating farmers.

The aims of the land reform were to solve the food problem, seriously aggravated after the war, and to achieve social and economic stability through establish-

*HIDEO ISHIKAWA: A leading agricultural journalist in Japan, he is vice president of the Japanese Agricultural Journalists Association. Ishikawa represented his organisation at the recent International Federation of Agricultural Journalists congress in Europe as official delegate.



In the seven years between 1960 and 1967 the number of small tractors increased from 0.75m to 3m in Japan's farm areas.

ment of a large number of owner-farmers.

The emancipation of Japanese farmers from landlordism brought about rapid progress in the agricultural productivity. Average yield of rice per acre, for instance, rose rapidly from 3325 lb in 1955-61 to 3960 lb in 1968. This compared with an increase from 1800 lb to 2025 lb during a 48 year period from 1883-92 — immediately after the Meiji Restoration — to 1931-40 just before World War II.

The land reform, however, has not changed the petty farm management with the average holding of about 2.5 acres per farm household.

As a result, the postwar development of agricultural productivity had to be realised through improving land productivity within the frame of this small sized unit.

In the meantime, however, the number of small tractors peculiar to Japanese farming increased strikingly from 746,000 in 1960 to 3,079,000 in 1967, with a lift to a certain extent in labor productivity.

In the case of rice production — the basic sector of Japanese agriculture — although a part of farming works has been mechanised, the most labor-consuming jobs of transplanting and harvesting are still performed by manual labor.

Small sized farm management and incomplete mechanisation of rice cul-

ture have kept the labor productivity in Japanese agriculture much lower than the international level.

Since 1955 Japan has entered a period of high economic growth. Between 1955 and 1965, the annual growth rate remained at 10 percent. According to a certain economist, Japan's industrial production has recently ranked third of the world, following the US and USSR.

This rapid economic growth has also helped agriculture advance. In this field production has increased at an annual rate of 3 percent since 1955. One of the major factors has been the improved national income which has changed the demand for food products both qualitatively and quantitatively.

The demand for food has increased at an annual rate of 5 percent since 1955 while the content of starch in the national diet fell from 79 percent in 1955 to 60 percent in 1960 and then to 55 percent in 1964: about the same level as Australia.

It means that the market for quality food such as animal products, vegetables and fruits has steadily expanded year after year.

Mention should be made of the fact that excessive population on farms has been absorbed by industry and other non-agricultural sectors. The active farm population numbering 15.41m in 1955 shrank to 13.39 m in 1960 and to 10.59 m in 1967 — or by 3.3 percent annually. It now occupies only less than 20 percent of the total working population.



In view of this shrinkage, it has been possible to enlarge the size of the average farm.

The Japanese Government enacted the Agricultural Basic Law in 1961. The law aims at the renovation of agricultural structure to not only make the growth of agriculture keep pace with that of other economic sectors, but also to establish viable farms — as many as possible which can support their operators and families exclusively by farming.

In this sense, this law was modelled after the basic laws which had been successively enforced in Western Europe, such as France and West Germany, since 1955 with the purpose of ushering agriculture in a new direction.

The Japanese Government took up various measures, based on the Basic Law, to keep the income in balance between agriculture and other economic sectors.

In the course of agricultural development, from the enactment of the Agricultural Basic Law to date, there have occurred a number of serious problems:

- The gap in income between agriculture and other non-agricultural sectors has never been reduced. The agricultural sector in productivity has remained only around 30 percent of the non-agricultural one since 1961.

- The number of farm households reduced annually only by 1.4 percent between 1960 and 1967, while the percentage of part-time farm households increased from 66 percent in 1961 to 79 per-

cent in 1967.

- The rate of aged people and women to total active farm population has been increasing. The number of farm households with operators older than 50 years of age occupied 56 percent of the total in 1965. For women some 60 percent of the total population on farms was engaged in agriculture.

- Prices of farmland rose by 2.4 times between 1960 and 1968, preventing greatly an increase in farm size.

- Agricultural prices have gone up considerably. Prices of agricultural produce for human food rose by 8.5 percent annually between 1960 and 1967. This indicates that agricultural production was not sufficient to meet the demand.

In the case of rice, wheat and barley, for instance, their domestic prices are twice as high as import prices. These high prices of agricultural products depend much upon the support price level which is gradually pushed up by the Government every year.

Agricultural imports have much increased. They expanded 2.1 times in value between 1962 and 1966 and reached \$2135 m in 1968.

All the above conditions suggest that some new and strong measures should be taken to make for a smooth development of Japanese agriculture under the country's high paced economic growth. □

SPEND MONEY TO MAKE MONEY PART II



COUNTRY'S farm accountant adviser continues his report on how investors can make best use of funds put into farming grazing.

By I. KILLEN

LAST month I discussed the basic points of how to select a farm or station for investment — and the importance of obtaining expert advice from farm management consultants and stock and station agents.

The next important consideration is the detail of how the financing should be carried out.

Keep purchase borrowing to a reasonable level and, where possible, to interest only payments. Interest is tax deductible, but heavy interest payments are a drain on productive development spending. High income earners tend towards excessive borrowing on the strength of their debt servicing ability.

The successful businessman has spent much of his life at becoming a success — and no time at all acquiring the skills and knowledge needed to properly run a country property. He usually knows nothing about rural

matters, frequently makes the error that it's a cakewalk and winds up in all sorts of strife.

A trouble-free operation is needed. Most businesses have plenty enough problems without buying into more. Extract pleasure from a farm — but don't go overboard and make it a duty, which might soon result in a grind. Buy good advice and get your value out of it.

Employ men with the right knowledge. The type and number will vary with the program, amount of organisation involved, size of property and policy on use of contractors.

It is considered sound to employ a rural adviser or consultant for agricultural development and financial planning. If a skilled manager is employed, a consultant may not be needed for more than the planning stages.

Where employees lack the special skills and knowledge, then a consultant should be

employed on a monthly inspection basis and on call for advice when needed. This method allows him to supervise the development program.

Labor is usually one of the most expensive farm costs. Avoid extravagance with surplus labor. An ideal arrangement would be a good reliable manager, guided by an agricultural plan provided and supervised by a farm management consultant.

All development programs must consider the ability of the men. Management ability, as a single character, has the most important influence on the success of the plan. An extra \$1000 per year for a good manager is excellent economy.

Many owners want their country property within easy driving distance from their city home. They plan to go weekends to view progress . . . talk about future plans . . . discuss the drought . . . wool prices and generally take up the manager's entire and well earned weekend.

Everyone soon grows tired of this. Once a week becomes once a month, then quarterly and so on.

Farm income is irregular, often with only one or two main income periods — when the year's lambs are sold, or the harvest is taken.

Nearness to a city is not important, unless quick marketing of the farm's produce is a factor. It can frequently be a damaging influence by ruling out potential good areas. From Sydney, good pastoral areas are about a half day's drive. Nearer than this the land is useless mountain or nearer still high priced coastal plain. This of course differs with the other capitals, for example Adelaide.

The property can be purchased to suit a preferred enterprise — or, the purchase can be made on the merits of the land and the enterprise then selected to suit. Enterprise selection by gross margins analysis is an important method now in common use.

The taxation benefits for primary producers are recognised as generous. They aim at stimulating development and at the same time catering to the politically volatile farmers' unions.

As with other investment situations, rural enterprise must have a suitable corporate structure — for tax purposes in case of profits. A combination of partnership and company is generally the most frequently adopted. This subject is the province of the taxation experts, who keep abreast of the statute.

Detailed agricultural and financial planning outlined above follows the careful purchase.

The program can be tailored to suit a particular requirement which means that if the combined farm and business incomes are available for farm running development and debt repayment, then the amount available for a development program can be isolated and detailed such as:

	\$
Surplus income	12,000
Other interests	
Farm income	14,000
	<hr/>
	Total 26,000
Running expenses	10,000
	<hr/>
	16,000
Interest and debt repayments	3,900
	<hr/>
Available for development — first year ..	12,100



Special purpose loans are available through State banks for irrigation, drainage, soil conservation and other farm development.

Alternatively, it may be thought advisable to go in deep. The residual \$12,100 could be regarded as an amount available to service development borrowings. \$12,000 can meet repayments on about \$180,000 development borrowings, over a 10 year term.

There are numerous in-between alternatives for the faint hearted — or wise — investor.

Financing the property purchase and the development plan requires knowledge of the sources of rural finance.

Term loans are available from trading banks, at about 6 to 7.5 percent interest, with a reducing principal over a term of up to eight years.

First mortgage security is normally required. Lending margins and reduction

Farm development programs can be devised, tested and improved with the aid of computers. This is relatively inexpensive.

arrangements are unpredictable with development type properties. Aspects of ability to repay, collateral security, current policies of the bank and particularly personal standing with bankers will influence the proposition.

Assurance societies lend for longer terms for property purchase with first mortgage security normally required. Interest is 7 to 7½ percent with repayments calculated over periods of up to 33 years. Loans are for five years, and are renewable.

Some societies require their borrowers to take out life policies for an amount proportionate to the loan. Assurance societies provide the longest terms available to the rural community.

Term loans for development propositions are available through trading banks, Development Bank, State Government Banks for special purpose development lending.

Trading banks now provide a farm development loan with terms up to 15 years, sometimes more. Interest is from 6 to 7½ percent. As with any loan, prospects of success,

adequate security, the ability and integrity of the borrower are of considerable interest to the lender.

The Commonwealth Development Bank provides terms of up to 20 years, but write a term appropriate to their estimate of the borrower's ability to repay. Principal repayments can be deferred for a period to allow the development program to generate income.

Interest is at around 6 percent and security is required — it need not necessarily be first mortgage. A basic requirement is that the finance must not be available from other normal lenders at reasonable terms.

Farm income is irregular, often with only one or two main income periods. This situation calls for advances to cover running costs till a major income falls due. These advances are available through pastoral houses as carry on advances.

Trading banks require registered land security — pastoral firms require livestock mortgages or loans against wool or other farm produce.

Special purpose development loans are available through State Banks. The purposes include irrigation, drainage, soil conservation and other development projects. Advances for flood and drought relief are also available.

Terms are variable according to the purpose of the loan, but are generally favorable. Interest is less than normal bank rates. Security requirements are land mortgage, not necessarily first mortgage or a statutory

Lenders to the Australian rural community know that droughts, floods and fires affect the borrowers' ability to repay their debts.

charge which precedes other charges or mortgages.

Private sources of finance deserve mention and include vendor's finance and loans through solicitors. The terms vary with each agreement. It is not unusual to obtain interest only borrowings at rates around 8½ percent. This has the advantage of preserving income for development instead of for debt repayment.

The terms are short depending on arrangements, but frequently renewable. Vendor's terms are quite common, particularly from those retiring from a farm or station. Interest is frequently at bank rate, 6 to 7½ percent, and some vendors want periodic principal reduction.

A typical credit arrangement would be:

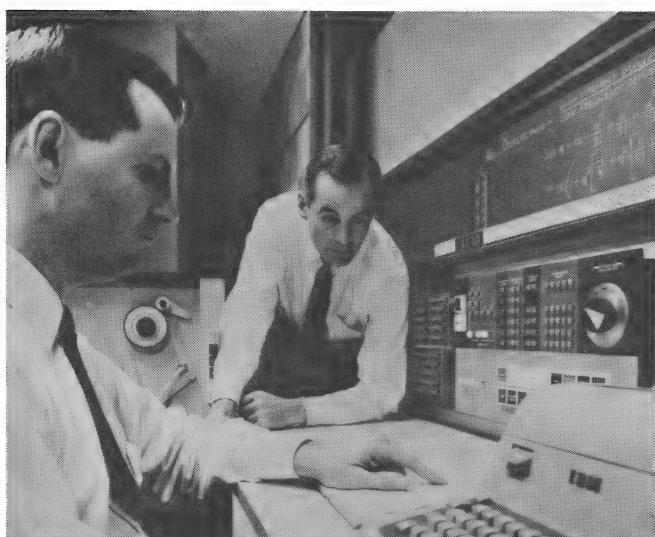
	\$
Land	80,000
Lending margin (security value)	64,000
Trading bank, term loan,	
1st mortgage	28,000
which should be adequate to finance stock and plant pur- chases.	
Development program:	
Irrigation layout	5,000
Timber clearing and pasture improve- ment	<u>10,000</u>
	15,000

Development borrowings:

Irrigation — through agency of NSW statutory charge required	5,000
Development Bank \$ second mortgage	10,000

This is a total borrowing of \$43,000 on land worth around \$80,000. This is a typical situation, but not representative of maximum or minimum borrowings.

(Continued on page 86)





These Merinos were brought in from drought areas for fattening to provide some quick cash for Stewart's breeding program.

FAT LAMBS COME TO N. QUEENSLAND

Lambs for the north Queensland market have usually come from the west, but an Atherton man hopes to cash in on this market with a home grown product.

By DAVID WHEATLEY

IN the middle of 1969 much publicity was given to the movement of sheep from drought-stricken areas of western Queensland to properties in northern NSW.

But not all of these animals went south. Some came to North Queensland — into areas where sheep rearing has not previously been an important activity.

The severe drought in Queensland, however, is only part of the reason for the 2500 sheep now on Ron Stewart's property at Rocky Creek on the Atherton.

Stewart hopes that they will provide him with a starting point for an intensive fat lamb raising venture which he has been gradually putting into practice.

Previously Ron relied on pigs and grain crops of maize and sorghum as his farm's main source of income. He found that his farm wasn't really suited to pig production — nor was his temperament.

And, as the name of near-

by Rocky Creek implies, the soil had too many stones in it to be used for farming.

"Of the 500 acres, only about one-third can be farmed successfully," he said. "I knew that to make the farm a really economic proposition, I'd have to find a way to use more of my land."

Finding this involved a good deal of research into the findings of tests carried out by officers of the Queensland Department of Primary Industries.

One advantage Ron does have is immediate access to water. The main irrigation channel leading from the nearby Tinaroo Dam to the Mareeba tobacco lands further west cuts right through his property.

"There have been farmers who reckon that the channel running through their farms was nothing but a nuisance, the way it broke up their properties," Ron said. "But I'm not one of them. As far as I'm concerned, having it is like winning the lottery."

With plenty of water available, Ron decided that his best course of action would be to establish irrigated pastures. But before he did that he wanted to know just what use he would make of them.

"I found out that trials on irrigated pastures around here had shown that it was possible to run 2.5 beasts to the acre if small amounts of fertiliser were used," he said. "But I felt that fat lambs and wool production seemed a better proposition than beef. I estimate that I should be able to run 15 to 20 ewes, and their lambs, to the acre."

One thing which made raising fat lambs a tempting proposition was the results of a survey the DPIQ conducted. This showed that considerable numbers of lambs were being killed every week to supply butchers in North Queensland.

"All of those lambs were coming from the west," Ron said. "There were so many carcasses needed I decided it would be worth while rearing them locally."

Working with sheep wasn't exactly new to Ron. He'd spent several years in northwest Queensland.

"I started off by working trucks on the main road, and when I found that wasn't a paying proposition I switched to contract fencing. But between jobs, I often worked on sheep properties."

Ron still had to see how sheep would do in his area — an area previously used only for grazing of beef cattle — before he could start his scheme. So, at the beginning of 1968, he bought 30 ewes — the 'pioneers' he calls them — and set them up as an experimental flock.

"Most of them were Merinos," he explained, "but there were a few Merino-Border Leicester cross in the flock. The Border Leicester cross did well, right from the start. After they'd settled down, so did the Merinos."

Although he planned to breed primarily for fat lamb production, Ron wanted a sheep that would also provide him with wool.

"Unless I could keep up the quality of wool on my ewes, I knew that the project wouldn't be economic," he said.

For this reason, he decided to concentrate on the Merino ewes, and mate them with Border Leicester rams. The rams came from Silver Hills, near Richmond. Some are stud rams, while the others are flock.

At the beginning of 1969, Ron put the second part of his plan into operation. He purchased some 1000 ewes from the Hughenden region — ewes which were being sold because of the drought.

"It will be about two years before I'm fully into production," he says. "I have to breed the ewes I want from my present flock."

In the meantime, Ron is making the change gradually. "I'm getting myself into a position where I can switch from pigs to lambs without any loss of money," he said. "I've reduced my pigs from 70 sows to 20. As well, I'm fattening lambs and wethers as an additional source of cash income until I start producing my own lambs."

The lambs and wethers used for this quick fattening project also came from the Hughenden district. Many

of them were in very poor condition.

Transporting the weakened stock meant problems. As well, Ron found bot fly a menace to the new mobs. "The sheep seem to get an attack of it just after they arrive," he said. "Then the trouble settles down. So far, it hasn't continued long enough to be a great worry."

Ron is also busy establishing green panic pastures which will be irrigated when the scheme gets going. "Right now, I'm not far enough into lamb production to make irrigation a paying proposition," he said.

However, the facilities to irrigate the pastures have already been established. Ron's previous experience with grain crops will enable him to make the best use of the water he gets from the Tinaroo channel.

"If you only want to irrigate a crop once or twice, pipes are more efficient because of the time you save," he says. "But if you're planning to irrigate over a period of several months, then earth channels get the water where you want it quickly and cheaply."

Consequently the small channels are a feature of the property. One of these runs from the main channel to a small dam near the homestead.

If Ron does want to use pipes he can pump from this, without having to lay a long line to the channel, almost a mile away.

During the next two years, Ron has the yards and shearing sheds to construct, most of which he will do himself.

He runs the farm single-handed, apart from occasional casual labor which he hires on the weekends.

Ron's sheep rearing venture gave one of his neighbors a laugh during a recent tour of Ireland. As the neighbor explained: "A farmer was telling me with pride how he'd managed to arrange the farm so that three shepherds were able to look after 600 sheep. And I thought of Ron Stewart — coping with over 2000 of them, all by himself." □

Ron Stewart — the man who hopes to introduce fat lamb breeding to the Atherton Tablelands in the north of Queensland.



A picture of things to come; crop stubble provides grazing for crossbred sheep on Rocky Creek in Stewart's lamb development.

Ron Stewart beside the main Tinaroo irrigation channel: "It's as good as winning the lottery."



HOW TO GET MORE FROM Mo



More than 8m acres in WA need molybdenum for cereal and legume production. This report looks at the best methods to use.

FARMERS who try to save costs by mixing molybdenum in lime for seed pelleting could be looking for trouble. This was shown in a WA experiment by J. W. Gartrell of the State agriculture department.

In the Australian Journal of Experimental Agriculture Gartrell reported that sodium molybdate, when mixed with ground limestone and pelleted on to Geraldton sub, inoculated with peat culture, markedly reduced clover nodulation, growth and nitrogen production in the

foliage in comparison with plots which had no sodium molybdate applied.

However, mixtures of sodium molybdate with superphosphate, and the clover seed pelleted with ground limestone, had no effect on nodulation, increased dry matter production by 70 percent, and increased nitrogen per acre in tops by 110 percent, compared with plots not having been treated with molybdenum.

Normally molybdenum is applied by farmers at 1 oz an acre mixed with 90-187 lb of super. This is sufficient

This photo shows how effective nodulation boosts legume production. The plant at left is well nodulated and vigorous.

Nodules on this plant are small, due possibly to a lack of the trace element molybdenum. They contrast with photo at left.

for clovers for several years in the 8m acres of deficient soils in WA — the earthy yellow sands.

Farmers in the area also plant extensive pasture areas with inoculated and lime pelleted seeds. The idea had been put forward that by including the molybdenum in the lime pellets, costs could be cut.

Gartrell found that earlier research had produced conflicting results, so he designed a further test of the method. He put down plots on J. Thyne's property, 15 miles south east of Merre-

din, on Norpa sand.

The trial paddock had been cleared in 1963, sown to cereal with copper-zinc-super in 1964 and was sown again in 1965. The seed went in May 1966.

The trial was in two main groups:

- Uninoculated seed — 12 lb lots — had treatments of no molybdenum, 3 oz of sodium molybdate and 6 oz of sodium molybdate.

- Inoculated seed — again in 12 lb lots — had treatments of no molybdenum, 1.5 oz, 3 oz or 6 oz of sodium molybdate applied

with the super; and the same amounts applied in the lime for pellets.

Three weeks before planting the inoculated seed was pelleted with 6 lb of Rodda ground limestone and Meth-

ofas at 2/3 oz per 12 lb of seed. Inoculo was used according to manufacturer's instructions. The super-Mo mix was prepared at the same time.

The seed was sown May

18 into dry soil through a 12 run drill at 12 lb an acre. Super went on at 180 lb an acre and germinating rain fell on June 6.

Table I sets out the main results from the trial. Where seed was inoculated and molybdenum was applied with the super — or not used — some 97 percent of the plants had nodules.

Where the sodium molybdate was used in the lime pellets with inoculated seed, plants nodulated ranged from 41 percent down to only 6 percent.

Inoculation boosted nodulation significantly only when molybdenum was applied — sodium molybdate with super increased dry matter 70 percent when used at the 0.5 oz per acre rate.

The Mo in lime pellets reduced yields at all rates.

The treatments had little effect on nitrogen concentration in the herbage, but inoculation did reduce foliage molybdenum concentration.

Contrasting his work with studies by R. A. Date and G. R. Hillier of Sydney University, Gartrell said they had found the lime pelleting-molybdenum-inoculation of seed method had not affected nodulation.

However, Date and Hillier had used molybdenum tri-

oxide, which might be less toxic to the rhizobia, a different pelleting gum might have offered more protection and storage temperatures in WA would have been lower. The field conditions in WA were also different.

Gartrell said that sodium molybdate "may be harmless provided seed is planted within a few hours of preparation and germinates soon after planting". However, under his State's weather conditions it was hard to ensure this happening.

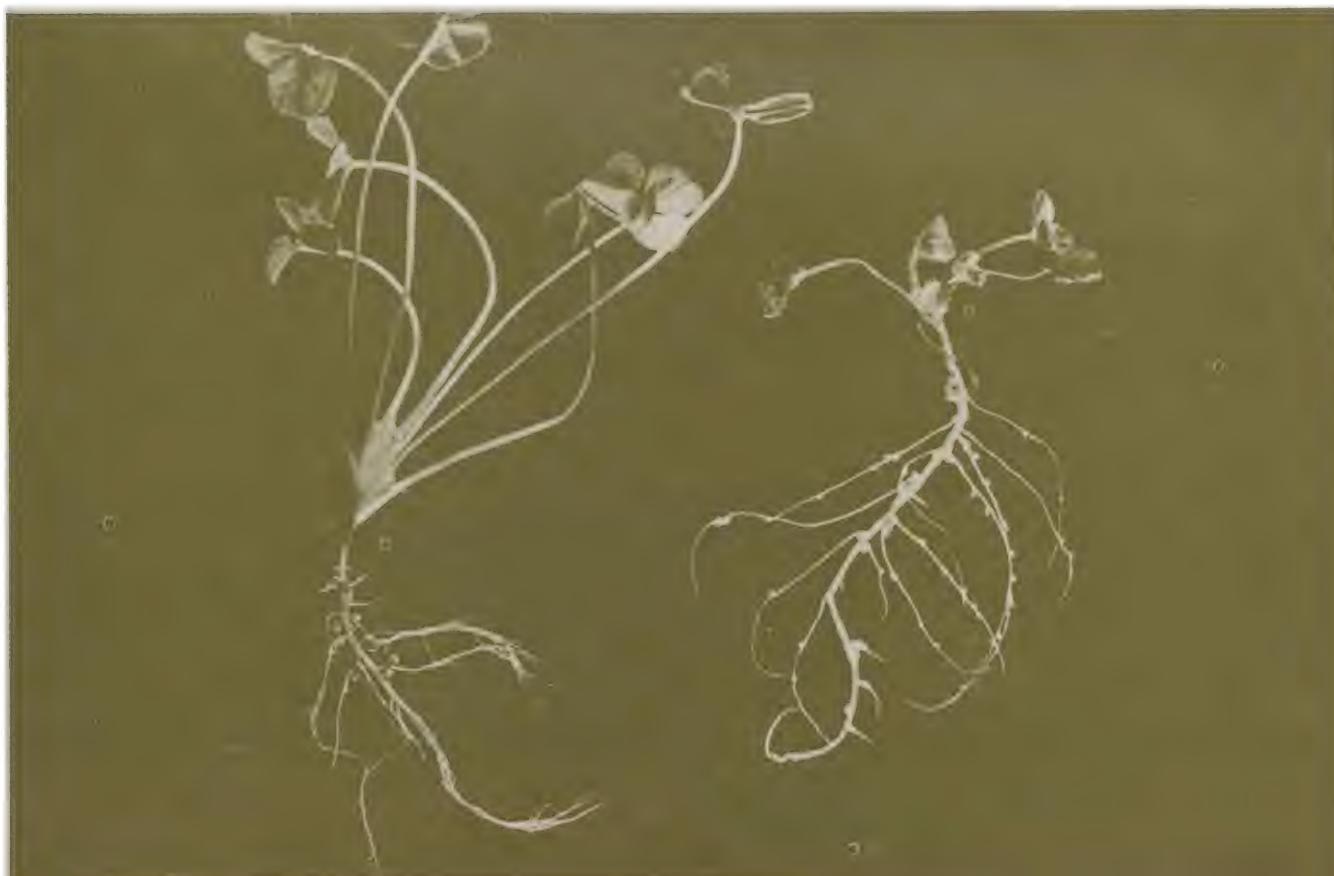
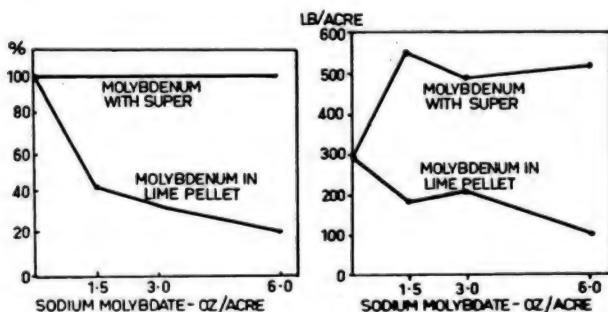
"The inoculated lime pellet method must introduce some risk of inoculum failure in most dryland farming environments," he said. Also, as this method produced high molybdenum levels in herbage, the risk of copper deficiency in stock was increased.

"If molybdenum is to be applied with pelleted seed it may be better to add it after pelleting. This method gives lower herbage molybdenum levels and the pellets while dry should afford the rhizobia some protection from molybdenum," he said. □

Under the WA trial conditions the use of 1.5 oz of sodium molybdate per acre with the super application gave the best nodulation in the legume.

EFFECTS OF INOCULATION

Test	factor	Sodium nil	Molybdate at with super	Molybdate at in lime pellet
Plants nodulated not inoculated inoculated	percent	37.1	31.6	13.4
		97.7	96.5	33.2
Dry matter not inoculated inoculated	lb/acre	229	201	117
		284	482	201
Nitrogen concentration in tops not inoculated inoculated	percent	2.11	2.12	1.99
		1.72	2.00	2.07
Molybdenum concentra- tion in tops not inoculated inoculated	p.p.m.	1.08	7.00	13.00
		0.58	5.10	8.60



SWEET WATER FROM THE SUN

In the past decade solar stills to produce fresh water from salt have been improving all the time. This report, condensed from a paper by ROGER MORSE of CSIRO, to the Solar Energy Society in Canberra, brings us up to date on developments.

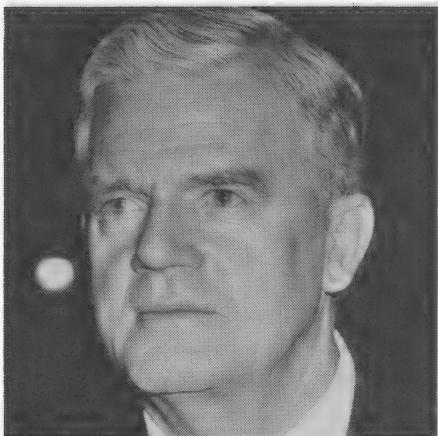
SOLAR stills have been steadily refined over the last seven years to a point where we believe they are now a commercial proposition for water deliveries up to 50,000 gal daily.

A useful stock water size

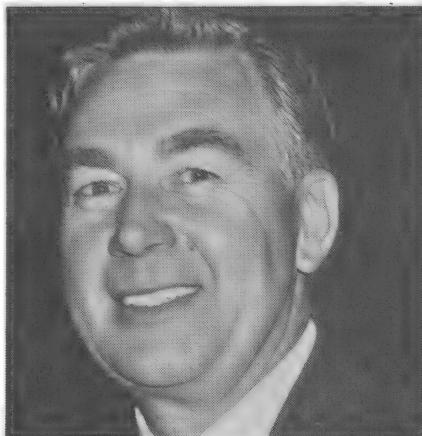
seems to be 400 to 500 gal per day, derived from a still covering 5000 sq ft.

Output may be increased by mixing untreated brackish supplies with distilled water, which emerges from the solar still in a very pure

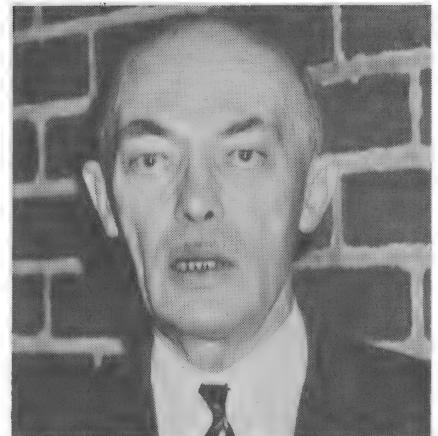




Roger Morse, chief of the CSIRO division of mechanical engineering, Melbourne, is chairman of the International Solar Energy Society.



W. R. Read of CSIRO has been working on the Mark VI solar still, which is said to be the most promising unit of this type.



F. G. Hogg chaired the Canberra solar energy conference. He is assistant to the chief of CSIRO's mechanical engineering division.

state. In other words, mixing volumes with very low mineral content with controlled amounts of the unrefined supply, will give an average mineral content in the water acceptable to stock.

Units run for long periods without attention, but we have learnt not to depend on operators to do even simple maintenance, like repairing leaking plastic lining. We have come to recommend durable materials including butyl rubber and concrete walkways.

As an indication, stills cost about \$1 a sq ft to install and produce 25 gal per sq ft annually.

Regarding their life, we are only just dismantling at our centre at Highett, Victoria, the first still CSIRO built. It has worked continuously for seven years — mostly processing sea-water — and has never been cleaned. The latest design should have a far longer life — perhaps 20 years without excessive maintenance.

Frequency of cleaning and exactly what is needed in the way of maintenance are still to be resolved. But overall the solar still looks to have a bright future, if used intelligently.

Contrary to popular belief, there are very extensive underground waters in Australia. The combined areas of all aquifers is 3.8 m sq miles—greater than the total land area, for aquifers often

overlap. Only 17 percent of this water has less than 1000 parts per million saline content, 14 percent is over 3000 ppm and nearly half is of unknown quality.

Although the possibility of sea-water desalination along the coast should not be ruled out, it has been the need for economic ways of sweetening subterranean water in remote areas which has provided the main spur for our work on solar stills.

Desalination by any process is costly, and cannot compete with natural run-off where water is needed in large amounts — even when the latter is piped long distances.

Prices which users are prepared to pay varies depending on the end use. Farmers in major irrigation areas are charged about 1c per 1000 gal to cover operation and maintenance, although the overall cost is probably nearer 8c. Market gardeners mostly use piped water at the usual town rate of 20c to 25c.

Sheep need a gallon a day each, and this can be quite brackish, and beef cattle need about 10 gal. Cattle and horses are not as tolerant of minerals as sheep.

Stock water points can be spaced at two-mile intervals for sheep and six miles apart for cattle. The proposed output depends on the stocking capacity of the land, but varies from 400 to 2000 gal per day.

It seems that under these circumstances, costs as high as \$4 per 1000 gal could be accepted normally.

In isolated mining communities, water is sometimes transported by road tanker at costs of around \$30 a 1000 gal.

But in this pattern of water-use, distillation is only likely to be used for small towns, remote communities, homesteads and stock. Its costs are two orders of magnitude too high for irrigation and one order of magnitude too high for city use when compared with alternatives available.

Mammoth schemes combining nuclear power stations and desalination do not appear to be practicable for Australia for the foreseeable future.

So, the main application for these stills seems likely to be in isolated areas, in sizes ranging from 400 to 5000 gal daily.

In these circumstances, use of solar stills is an attractive proposition.

The units operate as a result of solar radiation penetrating the glass roof and heating saline water in the central trough, some of this evaporates. Condensation takes place on the underside of the glass, which dissipates heat while the fresh condensate runs down and is collected in small side troughs. Advantages are:

- Simplicity.
- Output follows demand — more in warmer weather.
- Raw supplies may range from sea water to only slightly brackish.
- Skills needed for erection and running may be learned speedily.
- No power is needed.

● It is probably the only practicable process in many outback places.

The first solar still to operate continually in Australia was built at Muresk, WA in December, 1963. It was 4500 sq ft and drew water from a river varying in salinity from 1700 ppm to 14,000 ppm.

The original was replaced by an improved design in November, 1966, and at about the same time three more were put into commercial operation.

The new units were a 4500 sq footer at Caiguna, supplying a motel, a 6750 sq ft still at Hamelin Pool for another motel, and the 38,000 sq ft Coober Pedy still for the small town.

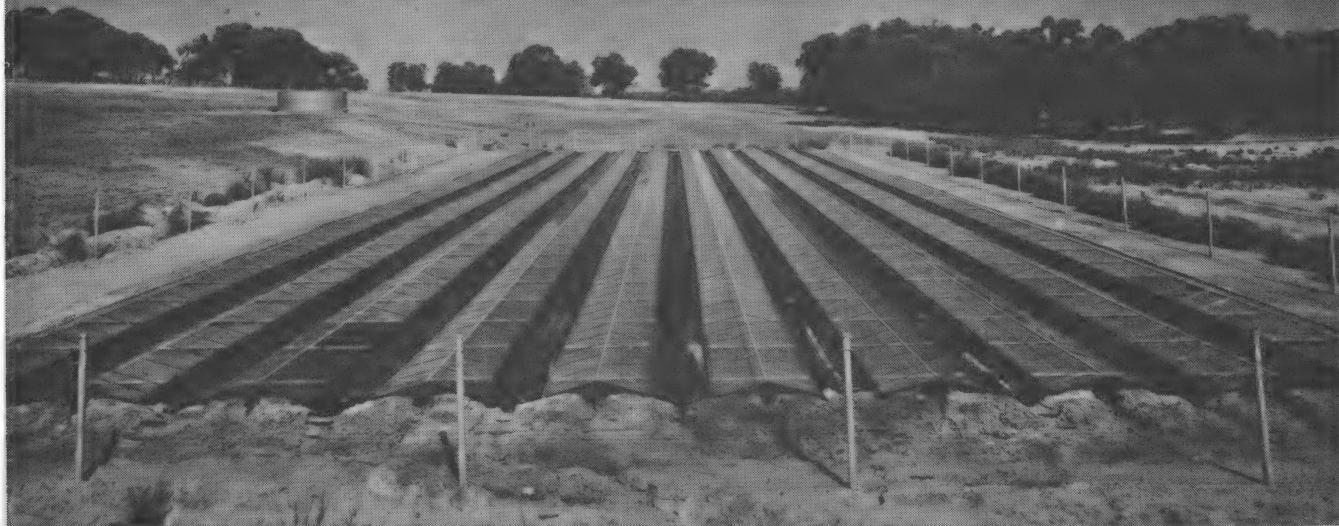
In August, 1967, a 5000 sq ft unit was built at the CSIRO division of mechanical engineering's field station at Griffith, NSW — essentially experimental — but the water was used in a laboratory and residence.

Production depends on the strength of radiation and the ambient temperature and variations from month to month. The monthly average for best performance is over 83 gal per day per 1000 sq ft.

Stills have shown a gradual reduction in output, believed due to deterioration in the polythene base and distillate trough lining. We no longer recommend polythene as a liner and prefer the more costly butyl rubber.

In the light of our experience the following is suggested in operating a solar still:

The still at Coober Pedy in SA provides water for the small town from a 38,000 sq ft area of glass over the distillation unit.



At Northam in WA this experimental still has provided valuable data on solar distillation for the dry area grazier in the outback.

- A continuous supply of saline water must be available at the rate of 0.1 gal per hour per sq ft of still surface.

- Most faults develop soon after completion, and close attention is required for at least the first two weeks. After this there should be regular weekly inspections reduced later to monthly visits.

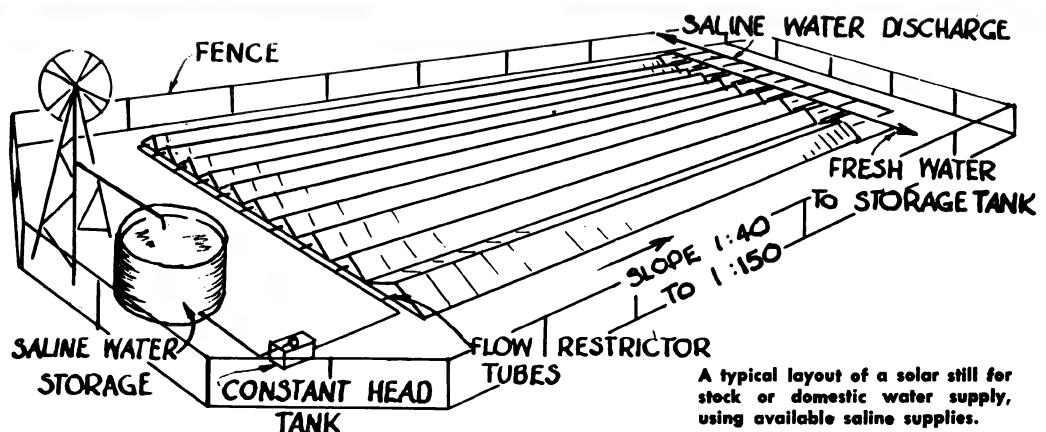
- Cleaning depends greatly on the properties of the water going through. Even with continuous feed, a thin layer of calcium carbonate will build up on the surface of the water when the supply comes from underground and after several months in some areas the water becomes quite milky. It seems prudent to give an annual flushing-out.

- It does not seem necessary to clean the glass, except possibly after an exceptionally severe dust-storm.

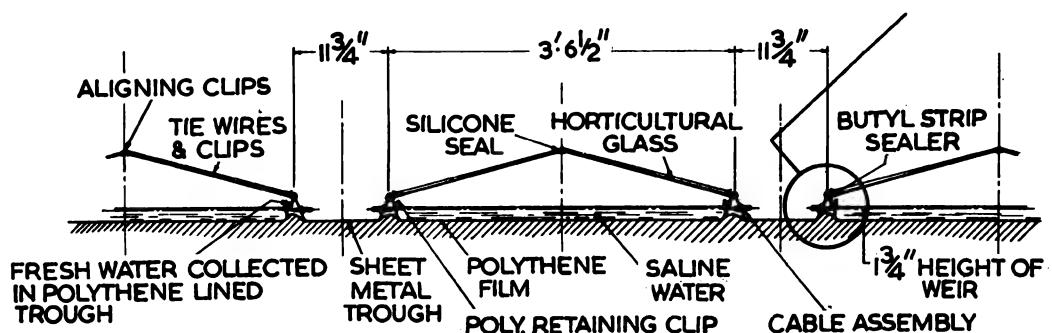
- Since no still has yet given completely trouble-free service and improvements are constantly being made to design, provision should be made for progressive incorporation of the latter to correct unsatisfactory features.

- Algae growths have occurred at Muresk, where the saline water was drawn from a river where salt content at times dropped to 1400 ppm, but this can be controlled. □

Next Month: New developments in solar hot water heating for farm and station use.



A typical layout of a solar still for stock or domestic water supply, using available saline supplies.



A cross section of a CSIRO still. Butyl rubber is now recommended instead of polythene linings.

CSIRO Research

R. N. Morse, whose summary of the current position with solar distillation is reported on these pages, is chief of the CSIRO division of mechanical engineering, Melbourne.

His division has been associated with perfection of this technique for a number of years, leading it forward to the present stage, when commercial production of stills is beginning.

Morse recently became the first Australian chairman of

the International Solar Energy Society, and will chair that body's 1970 world conference in Melbourne — the first to be held outside the US. He is also vice-president of the Australian and NZ branch.

The Solar Energy Society of Australia and NZ is an eight year old branch of the world body formed in the US in the mid 1950s to band together scientists, engineers, manufacturers and others concerned in harnessing energy directly derived from the sun.

It has become the largest branch apart from America's, and will be host body, in March 1970, to delegates from many countries at a

five-day symposium in Melbourne called to discuss:

- The status of solar energy applications in various parts of the world.

- Solar water heaters, silicon cells, air heaters.

- Radiation measurement, data processing and solar simulation.

- Solar energy economics, with particular reference to developing countries.

- Distillation by this means.

- Air conditioning, refrigeration and solar energy considerations in architecture.

- Solar furnaces and power in general. □



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HE RUNS 170 MILKERS ON 203 ACRES

The high carrying capacity of this dairy farm reflects the big capital investment and good management practices put into it, to make it one of the top NSW milk producers.

By COL BEGG

WHEN George Burgess decided to build a new set of bails on his Bega dairy farm, he must have written an "open" cheque and asked someone to design and build the best in the district. And — that is just about what he got.

The old wood frame, walk through milking-shed was not efficient enough to handle the big herd. Milking and feeding used to take about 5.5 hours in the old system but now — the time has been cut to three hours.

The new shed is a brick structure with tiled roof and, in every respect is as modern as tomorrow. It is basically divided into three parts — the milking area, the milk room and an upstairs feeding loft. All interior walls are cement rendered and the well laid out yard system is all concreted with pipe railing.

All manure from the bails area and the yards goes into a liquid manure tank at the lowest point of the yards for later distribution on the pastures. With a herd the size of this one, the liquid manure represents a cheap and most regular source of fertiliser — worthy of the expense involved in the tank and the spreading equipment.

Burgess' shed is a herringbone design with a low line McDonald machine, eight sets of cups per side. One of the three operators told me that the herringbone system was the best he had used. It offered good access to the cow for wash down and stimulation as there is a minimum of railing above the pit. The herringbone also allows for easy clean up after milking.

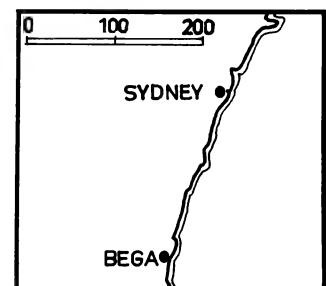
The only disadvantage with the system is that slow

milkers in this predominantly Jersey herd sometimes have to be turned out with those that are finished and returned for stripping out with the next batch, via a side entry gate.

There are only a few cows that come into this category and the milkers say that these do not cause too much bother. The herd is Jersey with a fairly young average age. Heifers present little trouble when being broken in to milking with the herringbone system and good handling is part of the reason.

All the Bega milking area is now converted to bulk pick up and the Burgess farm has a spotless, brand new, 500 gal stainless steel tank in the milk room of the dairy shed. The tank is placed near a roll-up type door, giving excellent access to bulk tankers from the local co-op.

The third room in the dairy is above the milking area and is used as a feed loft and automatic feeder to the bails. Feed consists of hammermilled lucerne hay and pollard. It is brought up



to the loft in bags via the outside stairs.

The floor of the room is covered with the feed and, when I asked how it was distributed to the cows, one of the milkers scraped away some of the feed from near the wall. Set into the concrete floor is a series of galvanised iron shutters which gravity feed into the specially made up mangers in the bails.

They had experienced a little trouble with the feed "bridging" in the shutters and it was sometimes necessary to give it a little "persuasion" with a ramming stick, to flow more freely.

Delivery to the mangers is through specially designed hoppers fitted with a regulat-

Picturesque, but very functional design with the bulk tank just behind the roll up door on the left of the shed.





Feed consists of normal pasture grazing, lucerne hay and pollard in the bails and regular feeds of grass silage for the herd.

ing gate and two rope controls. Individual feed rates can be controlled for the cows to ensure that each gets her correct intake. The rope controls run through a series of pulleys to the edge of the pit area, for operator convenience.

At the time of my visit to the Bega area, it was still mid winter and Burgess was running between 140 and 150 cows. In the summer his

figures are up to 170.

Expert advice is available in the form of the local Department of Agriculture officer C. Ubrihien. Ubrihien and his staff work in close co-operation with the dairy farmers of the district with advice on a multitude of problems.

The cows on Burgess' farm are grazed on high quality pasture which is irri-

gated from the Bega River and they get supplementary feed from grass silage cut on the farm. The total storage is about 250 tons at the moment, in two pits. The silage is loaded onto a flat top trailer and distributed to the cows on the pasture in a number of runs up and down the paddock, giving all cows a fair chance to get at it.

Galvanised iron shutters set into the concrete floor of the loft gravity feed the mangers in the milking area underneath.

Cleanliness of the milking operation is most evident when items such as the 500 gallon bulk tank are inspected on the farm.

By the reaction of the cows as soon as the trailer entered the paddock, the silage must be extremely palatable — they practically ran to the back of the trailer and started eating as soon as the silage hit the ground.

The cows are in extremely good condition and it is no wonder that the replacement stock bred from the herd is of such high quality. It is no mean feat to run 170 cows on 203 acres but Burgess and his hands do it extremely well and — it would appear — do it extremely profitably too. □





An exercise by the Bureau of Agricultural Economics has shown lot feeding can be profitable in Australia — but there are many "ifs" and "buts".

AT present feed and beef prices, fattening store cattle by dry lot feeding can be profitable in Australia — but only under special circumstances. This is according to the Bureau of Agricultural Economics in its Beef Research Report No 5.

Three major "ifs" are listed:

- Only young lightweight store cattle should be fattened.
- The purchase and sale price of the cattle should be timed to make the most of seasonal beef price movements.
- High energy rations containing about 80 percent

by weight of grain should be used.

The top return on investment with lot feeding should occur by fattening only one lot of cattle each year to take advantage of seasonal price peaks.

For a 400 head lot operated under these price conditions, a return of about 7.6 percent could be achieved — but only if lightweight cattle were fattened. The net return per head in this part of the BAE exercise was \$5.45.

Although total net returns might be higher if two lots of cattle were fattened each year while still taking advantage of seasonal prices, rates of return to outlay were expected to be lower.

An attempt to operate a feed lot for 12 months of the year would probably result in a loss on the operation, "under average beef and feed prices and management".

The operation as studied by BAE is very sensitive to changes in the relationship between beef and feed prices. Using the best com-

ASK FOR DETAILS

Thinking of going into the feed lot business? If you are, be sure to read thoroughly the new booklet "The Economics of Fattening Store Cattle by Dry Lot Feeding", published by the Bureau of Agricultural Economics as Beef Research Report No. 5.

The report was prepared by G. G. Hirst and G. W. Reeves of the BAE beef section and was financed by the Australian Meat Research Committee.

ONCE A YEAR

bination of lot size, marketing time and operation, a drop of 1.5 percent in fat cattle prices would cut net returns by \$320 and provide no return to management — unless, of course, feed prices fell too.

If feed prices rose two percent while beef prices remained the same, then the unit would again yield no return to management.

The opposite applies too — a lift in fat stock prices, or a cut in feed costs, adds handsomely to the profit.

Under "normal" conditions gains of about 2.9 lb liveweight per day could be expected over a fattening period of 90 days using high energy rations. The expected Total Digestive Nutrient — TDN — conversion ratios range from 5 to 6.1 for store cattle of 550 lb to 750 lb respectively.

BAE could find no consistent difference in price per 100 lb dressed weight for store or fat cattle. On average, a premium for quality only seemed to be paid during drought.

Movements in fat cattle prices according to season

varied in size and time between the States. Over a three month fattening period a maximum price rise of 22 percent occurs in average years in WA, compared with nine percent in the eastern States.

This rise starts in February in WA and occurs in successive months in Adelaide, Melbourne, Sydney and Brisbane. (See page 34.)

Energy units were generally more expensive as roughage, than as concentrates such as grain. Under almost all circumstances the optimum location for a feed lot would be at the feed source.

By increasing the size of the lot from 100 head to 400 there were important reductions in fixed costs per head — the cost of factors such as interest, depreciation, repairs and maintenance was spread over more animals.

It was found that net returns from lot fattening were not enough to meet fixed costs, including interest, for lots smaller than 400 head, except in drought time.

Reductions in fixed costs per head for a feed lot of a given capacity could be

TABLE I

LOT COST

IMPROVEMENTS	Capacity				depreciation	repairs, etc.
	100	head	300	400		
fencing yards	\$ 184	\$ 291	\$ 452	\$ 582	2.5%	4.0
feed troughs	438	438	518	518	2.5	4.0
corduroy	800	1,600	2,400	3,200	5.0	2.0
hay shed	300	600	900	1,200	2.0	—
grain shed	580	1,160	1,660	2,320	3.0	2.0
hammer mill	600	600	600	600	5.0	2.0
mixing shed	638	638	638	638	3.0	2.0
grain auger	640	640	640	640	3.0	2.0
cattle scales	375	375	375	375	5.0	1.5
tractor*	1,100	1,100	1,100	1,100	10.0	7.5
trailer	600	600	600	600	10.0	5.0
WATER SUPPLY						
earth dam*	405	810	1,240	1,650	—	3.0
tank, stand	350	800	1,140	1,300	5.0	—
pump, pipe	435	435	435	435	5.0	2.0
pump motor	206	206	206	206	5.0	2.0
troughing	76	76	152	152	5.0	—
concrete	53	53	106	106	2.0	—
Total outlay	8,397	11,508	14,623	17,443		

*Only 50 percent of these items were charged to the feed lot, for they would be used jointly with other farm activities.

TABLE II

FEED LOT NET RETURNS*

Item	Budget No. 1: Normal Year				Budget No. 4: Drought Year			
	Feed lot capacity — head							
	100	200	300	400	100	200	300	400
Capital (Table I)	\$ 8,397	\$ 11,508	\$ 14,623	\$ 17,443	\$ 8,397	\$ 11,508	\$ 14,623	\$ 17,443
Cash outlay:								
cattle	7,315	14,630	21,945	29,260	6,490	12,980	19,470	25,960
feed	3,483	6,966	10,450	13,932	4,122	8,244	12,366	16,489
operating cost	780	1,299	1,819	2,329	780	1,299	1,819	2,329
Total outlay	19,975	34,403	48,837	62,964	19,789	34,031	48,278	62,220
Annual equivalent of total outlay†	11,220	17,120	23,024	28,632	11,173	17,026	22,885	28,445
Total net return	113	792	1,476	2,180	300	1,164	2,034	2,924
Rate of return to annual equivalent of total outlay and management	%	%	%	%	%	%	%	%
	1.01	4.63	6.41	7.62	2.7	6.8	8.9	10.3

*Total outlay, net returns and rate of return to outlay and management, fatten one lot of 550 lb store cattle over 90 days starting May.

†As the expenditure on cattle, feed and inward stock transport is only incurred over three months, one quarter of the total cost of these items is included, plus one-eighth of the estimated expenditure on repairs and maintenance and on those other items included in "operating costs", as it is assumed that they occur evenly throughout the three month fattening period.

FEEDLOTTING MAY PAY

achieved by expanding annual throughput — but because no seasonal price margins could be expected under these conditions, profit per head would decrease at a faster rate than fixed costs per head, BAE said.

In their study of beef lots, Hirst and Reeves looked at four different types of budgets and the capital cost of setting up feed lots of four different sizes — 100, 200, 300, and 400 head. These capital costs are shown in Table I.

The budgets, based on Sydney prices, were:

- Budget No 1: It is assumed that the operator fattens only one lot of cattle each year, timed to take maximum advantage from the seasonal movement in beef prices — he buys stores in May and sells them fat in August. The lot would remain unused for about nine months of the year.

- Budget No 2: This considers the effect of fattening two lots of cattle each year, with the two 90 day fattening periods timed to take the maximum combined benefit from seasonal price move-

ments. Stores are bought in March and June and sold fat in June and September.

- Budget No 3: Three lots of cattle are fattened each year and the operator ignores the seasonal beef price movements.

- Budget No 4: The costs and returns from lot fattening during drought are looked at here. It is the same as Budget No 1, but is based on higher feed costs and a margin for quality when the fat stock are sold.

We will not take you through all four budgets, but will look briefly at Budgets No 1 and No 4 — the ones BAE showed to have the highest rate of return.

The prices given in Table II are based on Homebush, NSW prices. These are similar to those other eastern States capital city markets with a movement in prices over the season of about nine percent.

However, in Perth where the market has a seasonal movement of 22 percent, the rates of return may be significantly higher because of the greater difference between selling and buying

prices over the 90 days.

In any calculation of a prospective new venture it is essential to calculate what the investment could earn if the money was spent in another way — the opportunity cost. This varies with the situation on each and every property or district.

BAE do not make this calculation, for the above reason. However as a guide they suggest comparing the 7.62 percent earned by the 400 head lot in Table II with, say, bank overdraft interest of 6.5 percent. This leaves \$320 as the return to management in this situation above bank interest.

In Budget No 4 — the drought study — the same marketing method as in No 1 is applied, except that it is assumed the lot fed cattle will receive a \$3 per 100 lb dressed weight premium and feed prices are 2.17c a lb for grain sorghum and 2.72c a lb for lucerne hay, on the farm.

If interest — opportunity cost — of 6.5 percent were deducted from the figures in Table II, then the return to management from a feed lot

of 400 head capacity would be some \$1081, under the drought conditions assumed in this exercise.

This does not mean it would pay to put up a feed lot for use only in drought times. Fixed costs — depreciation, interest, repairs and maintenance — on a 400 head lot amount to about \$2240 a year and these would have to be met whether the lot was used or not.

If the lot was used only in droughts, the average annual rate of return to outlay would be lower than an overdraft rate of 6.5 percent even if droughts occurred every two years, BAE said.

This report, and tables, is only a very brief summary of the BAE 50 pages of facts and figures.

The study does not in any shape or form guarantee that someone going into a feedlot would make exactly what BAE has predicted from this study — it could well be more or less depending on the circumstances. However, it is one of the most valuable guides to come out in Australia on the subject. □

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SEE HOW THEIR MAIZE GROWS

So you think you can grow maize? Most Australians are beginners in comparison with the American national champion maize growers.

IN Australia the record for maize production stands at 230 bush per acre. This yield would be in striking distance of a top ribbon when lined up against the top US producers. However, there is much many of our growers can learn from their US counterparts.

Last season in the US National Corn Yield Contest 17 out of the 412 US entries of 25 or more acres topped 200 bush per acre. Missouri grower Orin Ross produced a crop going 240 bush an acre over 32 acres to take the top award.

How did he do it? According to a report by Farm Quarterly writer Rollie E. Deering, metal runners 8 in. wide by 12 in. long developed by Ross for his planter were a big help.

These planter shoes permitted faster more accurate planting 1 in. deep over the wide variation in soil types

on the champion Missouri farm. Accuracy of planting is rated very highly by all the champions.

This was stressed by T. and E. Remmers of Nebraska whose crops were 239.4 and 231.3 bushels — and second and third respectively — in the championships. They bought a John Deere plateless planter to eliminate skips and doubles in their crops.

Vacant spots in rows due to inaccurate planting cost fourth place getter Donald Armstrong of California 25 bushels an acre from a crop which actually yielded 225.5 bushels.

Accurate planting is a key to these high yields, but other factors are also vital. Weed control is a major worry and many competitors in the 1969 competition used Sutan and atrazine sprays to kill grasses (see COUNTRY July 1969, page 12).

Sutan, butylate, is a new maize herbicide just released in the US which is used in combination with a trazine to pick up late germinating grasses such as crabgrass, witchgrass and panic. It is under test here.

In past seasons US growers relied exclusively on various chemicals for weed control, but are tending to switch back to machinery cultivation of weeds.

Seeding rates for the champions is above the US average by 5,000 to 10,000 seeds an acre. They talk in terms of 20,000 to 23,000 plants per acre.

Opinion seems equally divided on whether to chisel or mouldboard plough.

Fertilising of course varies greatly from farm to farm depending on soil type and past experience. One farmer is using a converted anhydrous ammonia rig to inject 40 gal per acre of propane gas. Another uses overhead pivot sprinklers to apply nitrogen, some phosphorus and potassium.

Their techniques may be

Dryland maize yields in Australia range from 40 to 60 bushels an acre, irrigated maize around 80 to 90 bush mark. The record is 230 bushels set by a NSW grower.

way out, but they certainly achieve results worth studying by many Australian growers.

People like Clive Storey, a seed increase grower from Atherton, Qld, working on QK37 (see this month's cover and COUNTRY November 1969, page 49) already knows many of the tricks.

Len Barnes, the Mudgee NSW grower who harvested 230 bush per acre from five acres in the RAS 1969 maize competition might be able to offer a point or two to his US counterparts — and so could the five other Mudgee growers with crops over the 200 bush mark.

However, the average farmer growing 80-90 bush under irrigation, and the dryland farmer with his 40-60 bush average, could learn a lot from these techniques. □

MULTI-PURPOSE MERINO FIXED FOR TYPE

By JIM MAPLE-BROWN*

The Fonthill Merino is one of the most promising developments by a practical breeder looking for both wool quality and meat type in his stock.

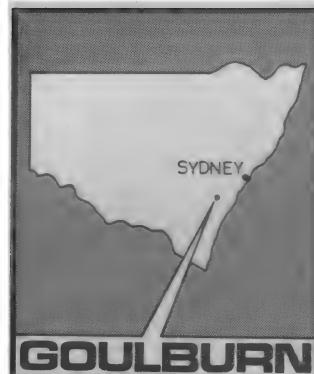
IN some ways the term "new breed" is appropriate to the Fonthill concept and in some ways it is not. It does divorce the Fonthill concept from the traditional Australian image of a Merino, and this is good, as it may encourage people to evaluate this pure Merino strain on its own economic merits, rather than compare it with what is now accepted as a typical Merino.

But the term has some disadvantage, because I am sure the only way to breed a sheep completely prepotent for wool of 64s count and finer — 23 microns or less — is with pure or near pure fine Merino blood.

No one breed or strain of sheep can produce economically for all markets or in all environments.

In animal breeding, this means the environment — both economic and physical — in which the animal will be required to show a profit for its owner. The breeder must also take into account such things as likely market trends and changes in the structure of the community.

In the high rainfall zone near Goulburn, NSW, where I farm it has become in-



creasingly clear that the traditional type of Australian Merino is not meeting the farmer's requirements. The swing to crossbreeding for the meat market is proof. What are the changes that have taken place?

First, the great increase in pasture improvement and the use of superphosphate have completely altered the physical environment.

Second, with a growing population in Australia and improving transport to overseas markets, the demand for meat is gradually increasing, and there are grounds for expecting that in the long term it will increase in price at least at an equal rate to the inflation of the Australian dollar. In other words the meat producer should maintain his purchasing power.

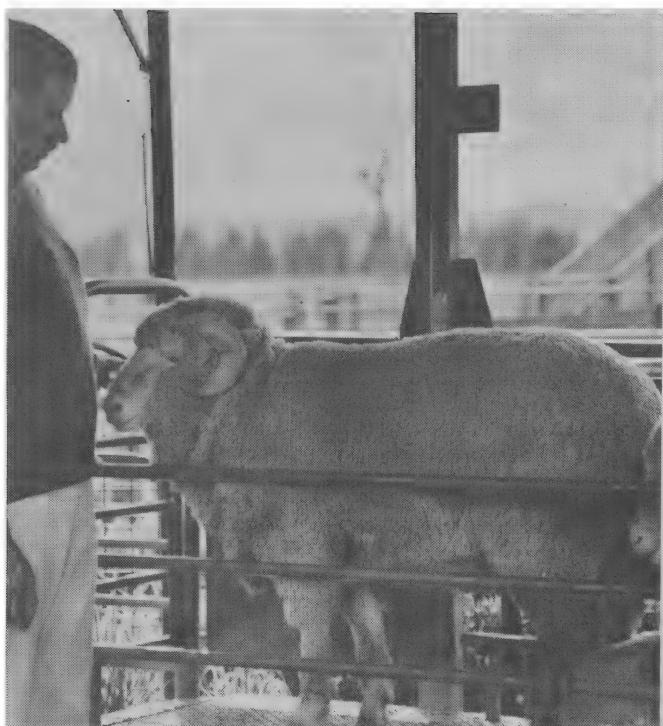
With wool the position is different. It is virtually all exported and rising living

*Jim Maple-Brown is studmaster of the historic Springfield Saxon Stud, Springfield, Goulburn. His Fonthill Stud is run on the property of that name near Lake Bathurst, some miles to the south of Springfield on the New South Wales Southern Tablelands.



Buyers from all States operate at the annual Fonthill sales held near Goulburn NSW when the meat type Merinos are sold.

A typical 12-month-old Fonthill ram is checked by Maple-Brown in an elevated classing and weighing race. This sheep went 153 lb.



standards or high rates of inflation in Australia have little effect upon the prices paid to the grower.

The third factor concerns the need for an easy-care sheep. Suitable labor is becoming difficult to get, and it takes a bigger percentage of the wool cheque.

The industry cannot afford to pay below going

rates for labor, as to be successful it must employ men of high standard. So the emphasis could be moving more towards a mini-care sheep and slightly away from the maxi-production animal.

The possibility of developing a Merino to suit these changing circumstances was demonstrated when on a visit to USA in 1950 I saw



the type that was proving economic in that environment. On my return there was a chance to experiment with two Texas Rambouilletts imported that year by Ray Bladwell of Goulburn.

The next step in the development of the Fonthill concept came a little over two years ago when I went to South Africa, met T. P. Van de Walt and saw the Letelle Merino which he had developed.

LAMB TRIAL

This proved beyond doubt what could be done with pure Merino sheep. To secure independent evidence of their meat potential I asked the South African Meat Producers co-op to assess this breed in the pure form as a prime lamb producer. Here is a summary:

The average weight of the lambs born was about 11 lb.

At the first weighing the lambs averaged 18.9 lb and the average weight a month later was 40.3 lb which rep-

resents a live weight gain of 21.4 lb in 30 days — an average daily gain of 0.71 lb. During the second month the weight gains were even better: 24.7 lb in 30 days, an average daily gain of 0.82 lb.

During the third month the lambs gained an average of 19.3 lb in 32 days, an average daily gain of 0.6 lb.

It had originally been planned to market the lambs at this stage — about 100 days. The period from the initial weighing date to this date was 92 days and the average total live weight gain per lamb was 64.9 lb: an average daily gain of 0.71 lb per lamb for the period.

Because of quota restrictions, however, the lambs could only be marketed 17 days later. During this period, the lambs only gained an average of 6 lb live weight, or 0.35 lb per lamb per day.

Over the entire 109 days the lambs gained an average

of 70.9 lb in live weight — an average daily gain of 0.65 lb. Average final live weight on the farm was 89.8 lb.

Average warm carcass weight was 42.3 lb, representing an average dressing percentage of 47.0 percent. All carcasses were graded super — the highest grade for lamb in South Africa.

A characteristic was the excellent fleshing throughout and the fact that there was hardly any superfluous kidney and channel fat. Although the majority of carcasses showed a good even distribution of subcutaneous fat, a few were inclined to have a little too much subcutaneous fat.

The average eye muscle area was 15.4 sq cm.

GROWTH RATE

So these conclusions can be drawn from the study:

- Rate of growth of the lambs can be regarded as excellent.
- If maximum use is to be

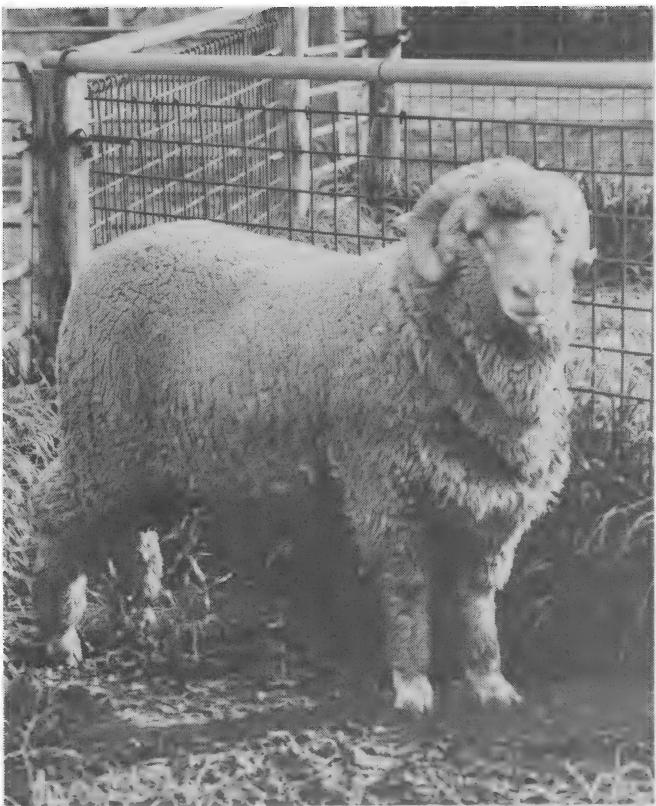
made of this fast growth rate, lambs should not be marketed older than 100 days of age.

● The fact that some carcasses were inclined to have too much subcutaneous fat also indicates that the lambs could have been marketed earlier.

● Because fat deposition is expensive in terms of nutrients and because it can retard the growth rate considerably, it is also desirable, from an economic point of view, to market the lambs at an earlier age.

● Unfortunately the bone: muscle: fat relationship in these carcasses could not be determined, but indications are that it was good.

I believe Van de Walt is the world's leading authority on breeding this type of Merino. Since 1920 he has learnt by observation and



The open face of the Fonthill Merino is a feature Maple-Brown regards as extremely important in the stud's selection program.

Young ewes, 15 months old, show the plain body wanted at Fonthill. Their liveweight averaged 110 lb and their cut 11 lb.



Prime Dorset Horn sired lambs were produced from this flock of mixed age Fonthill ewes in the station's September drop.

experiment the compromises that are necessary to achieve a truly balanced Merino.

The quarantine regulations make it impossible to import Letelles but for two years now I have been applying his selection pressures and breeding principles at Fonthill with pleasing results. The main breeding principles behind this concept being:

Should it become economically desirable in Australia to breed large numbers of fine wool prime lamb mothers quickly, then it is only possible to do this with genetically fine-wool rams.

Fortunately it has been proved that fine wool is genetically dominant over strong wool. A pure Saxon or Rambouillet Merino ram can in two crosses produce a medium to fine wool sheep from almost any ewe.

This makes it vitally important to the ultimate success of breeding a balanced Merino that only pure fine wool genes are used in its evolution.

Probably the most important production attributes for a balanced breed is that the ewe should be a good milker, as on this hinges the ability of the lamb to grow early and reach satisfactory weaning weight.



Most research I have studied points to open faced sheep producing more pounds of lamb per ewe at weaning than do wooly faced sheep of the same strain, even though they are kept wiggled.

The Letelle is a very open faced sheep and Van de Walt says that a heavy belly covering is undesirable as the blood supply in this region has to feed both the wool growing follicles and the milk vessels.

This makes sense to me and is substantiated by the undoubted mothering ability of the Border Leicester Merino cross ewe which is on average an open faced sheep with bare legs and light belly. Therefore I believe the open face is only the value in this context because it indicates good mothering ability.

A BALANCE

As in all things, there must be a balance here, if weight of lamb weaned is pushed to the genetic limit of the species either by high twinning rates or larger single lambs, then the amount of wool cut per head may fall away alarmingly.

In the Letelle and at Fonthill reasonable weights of wool are produced by keeping the fleece very dense on a large plain body. Density of fleece is maintained by having considerable pin wrinkles in the skin. This can, I have read, increase the skin area on a sheep by 50 percent without producing any flaps or heavy neck folds which are definitely undesirable on this type of sheep as, apart from anything else, they reduce the easy care advantages.

One of the principal things to keep in mind when breeding this type of Merino is that all the required production attributes are well within the genetic potential of the strain you are working with. This makes for uniformity and reduces the culling rate — two points of great economic importance in sheep farming.

Now I am going to specify what I consider to be the main attributes of a balanced Merino, all well within the breed's genetic potential:

● It must be prepotent for wool type to ensure a rapid increase in numbers should

this become necessary.

- The wool should be 64s and finer and not longer than 3.75 in. with 12 months' growth.
- Ewes should weigh an average of 130 to 140 lb when fully matured, in good condition and cut in the range 10 to 14 lb of wool.
- The Merinos' ability to breed at all seasons of the year must be retained and ewes should mark 100-120 percent of lambs if well fed. There must be a minimum of lambing problems, losses of economic importance must not be sustained when lambing is unsupervised.
- Mature rams should weight 180-200 lb and reach these weights at about two years. They should cut about 1 lb of wool for every 10 lb body weight.
- Lambs should be capable of putting on better than 0.6 lb per day live weight, up to at least 80 lb.

● The breed must be free, or nearly free, from fleece rot as its course may be mainly in the higher rainfall areas. Special attention must be paid to breeding sound footed sheep. It is doubtful if a Merino can ever be as resistant to foot troubles as, say, a Romney Marsh but my experience at Goulburn leads me to the conclusion that the balanced Merino is quite a lot more resistant to these troubles than the traditional Merino.

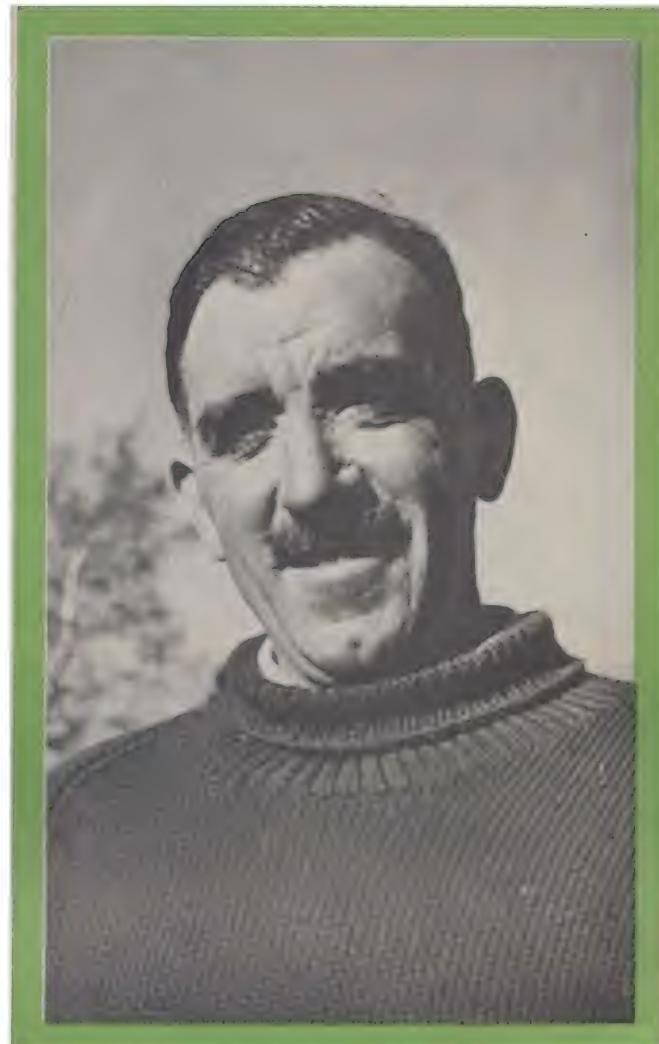
● Productive ability must be retained in old age, say up to seven or eight years under good management. The Saxon Merino already enjoys a good reputation in this regard.

Basically, the more types of pure Merino we have in Australia the better. This gives the industry flexibility within the changing environment.

PURE MERINO

This becomes vital if we wish to continue as the world's leading fine wool producing country, as in that case crossbreeding is not a viable method of changing the production attributes of our sheep. This has to be done within the Merino breed. (See COUNTRY, November, 1969, page 34.)

Each Merino strain must be assessed on the total income it can produce under particular market and graz-



Jim Maple-Brown

wether production by changing rams and the ewe has the added advantage that she will lamb at any season.

What the future holds is not easy to foresee but I have the notion that this balanced type Merino has several production attributes that will make it more valuable as time passes. □

THE TWO-WAY BET

COUNTRY has taken a keen interest in development of a dual purpose sheep — one with the wool quality of a Merino and the lamb or mutton qualities of a crossbred.

Fonthill work has been featured in the past — in the issues of September 1967, page 16; January 1968, page 32 and August 1969, page 69.

Other important reports on dual purpose sheep production include features in December 1968, page 22; and November 1969, page 34.

RUNNING PEOPLE FOR PROFIT

A farmer near Canberra has come up with a bright idea — he subdivided his property into 17 blocks, sold them as suburban farms, then leased back the land from the new owners to run his livestock.

THINKING of subdividing the property to meet demands from land-hungry urbanites?

Many landowners today on the perimeter of expanding cities are faced with this real situation. They have to face the fact that suburbia reaches out its arms for more and more land to run people rather than our traditional forms of agriculture.

Here an entirely new situation of selling land arises with the emphasis on what a householder — probably from a suburban street — needs rather than the amount

of super applied or the number of sheep shorn.

One such subdivider on the Southern Tablelands, near expanding Canberra, told COUNTRY of his experience of the problems and advantages of subdividing a sheep and cattle property.

The size of the property was 980 acres of undulating granite country with light stands of timber left as wind-breaks. Originally divided

Not all subdivisions can be worked as intensively as these — but they can still provide a good profit for both the subdivider and the buyer with a job in town.





into 10 paddocks, it ran 2300 sheep and 40 head of cattle while 150 acres were reserved for cropping. It is now divided into 17 "farm" blocks ranging in size from 41 to 90 acres.

Here is the way our interview went:

COUNTRY: What are the first steps to take when considering sub-division?

ANSWER: The local shire clerk was a great help to me. I would suggest talking over what you have in mind with the shire clerk and then find out the feeling of the local Shire councillors. It is in their hands whether the sub-division is accepted or not.

COUNTRY: What are the costs involved in making a sub-division such as this?

ANSWER: Costs are naturally a big consideration. This area, which has a bitumen road on two boundaries, had to have an access road constructed into the centre for two thirds of a mile. The accepted tender for this was \$5000. It has to be a gravel road 12 ft wide on an 18 ft formation and built to Main Roads Board specifications.

Other costs include surveying. In this case, a private firm did the job and charged \$2000. Fencing the boundaries of the blocks was another cost. This consists of six-rung hinge joint with four 10g wires — no bars because "Horses and barbed wire don't mix".

After this, there are soli-

citor's fees — about \$100 a contract after the sale has been arranged — and agent's commission which ranges from \$8 to \$10 an acre.

COUNTRY: Any tips concerning agents?

ANSWER: Yes. Choose a good live wire one for a start and pick your agents where the buyers are most likely to be. That sounds an obvious piece of advice, but many country men use the agents they are used to, the ones who sell their stock and crops. It's a different situation selling a place to live or a hobby farm.

On the other hand, city agents know little about the country and "get bushed". It's a good idea to take the buyers around yourself but

Water on every block would be a good policy for anyone interested in subdivision and sale of land.

The property described here was near Canberra. Buyers were people who wanted a small farm "away from it all".

let the agent do the job he's paid for, of selling.

COUNTRY: If you had the job of sub-dividing and selling all over again, what would you have done differently?

ANSWER: I would have worked over and over the sub-division again and again before it was surveyed to look for trees and building sites which could be fenced into every block. One naturally tends to look at the project from a grazier's angle rather than a subdivision for city tastes.

Making provision for water on each block would also be an advantage for sale. Lack of water, although putting down bores may be simple,

tends to frighten the city buyer off.

COUNTRY: Any other points on selling?

ANSWER: We now have half cash down and the rest over five years.

COUNTRY: Who are most of your buyers and why do they want land?

ANSWER: Some buyers look at the blocks as a retirement proposition. Others are commuters who want to live in the country and work in the town — we are only half an hour away by black top road from city offices.

Others just want to own a piece of country for a hobby, such as cattle raising, and there are also fringe tax benefits in being primary producers.

COUNTRY: Can you make use of the land during and after sales?

ANSWER: I still run about 1700 sheep and 30 head of cattle, mostly on a rotation system. Often the buyers can't afford to stock for some time and the blocks can be leased back for up to \$3 an acre, depending on whether they are sheep or cattle blocks. This helps the buyers, too, as it pays his rates.

COUNTRY: Was there any opposition to the sub-division from any authorities?

ANSWER: Even though the blocks are not reducible in size below 40 acres, and the Shire Council had the final decision, they had an urgent telegram from the NSW State Planning Authority not to pass the project until the authority's representative had a look at the scheme. The Shire Council chose to ignore this and went ahead to give permission for the subdivision. □



SOIL TESTS: USES AND LIMITS

By I. C. R. HOLFORD*



*I. C. R. Holford is a senior plant nutrition research officer with the NSW Department of Agriculture, based at the Tamworth research station, in the State's north.

Soil tests — a "great aid", or "completely useless"? Some farmers hold one view, some the other view. This report puts the issue into perspective.

AT sowing time farmers turn their attention to the use of fertilisers — what to use and how much. Over the past five years great interest has developed in the use of soil testing as a technique in answering these basic questions.

At the moment, in NSW alone, at least two fertiliser companies provide a soil testing service to farmers as does also the Department of Agriculture.

Unfortunately most farmers do not appreciate the limitations of soil testing. Consequently when a fertiliser prediction following a soil test proves to be wrong they tend to completely discount the value of soil testing.

To regard a soil test as infallible or, at the other extreme, to regard it as valueless are both equally faulty attitudes. To make the most intelligent use of a soil test and not be disillusioned in the cases where it proves to be misleading, the farmer must understand its shortcomings.

● The research program on which the current soil testing services in northern NSW are based was carried out by J. Edsaile of the Department of Agriculture and Dr J. Colwell of CSIRO.

● Forty-nine field fertiliser experiments were carried out in the northern wheat belt from 1962 to 1964. Yield responses by wheat to phosphate and nitrogen fertilisers were

measured. Various measurements were also made on the soils at each experimental site, the most important for the purpose of soil testing being the amount of so-called available phosphorus.

As in all biological measurements, particularly in agriculture, the results were very variable and only a general relationship could be established between the response to superphosphate and the soil phosphorus level.

The results showed that if the soil phosphorus level was greater than 35 parts per million no yield response could be expected from applying superphosphate.

In the range of 16 to 35 ppm there were 14 experiments conducted and of these only nine responded to superphosphate. This means that on soils containing 16 to 35 ppm phosphorus there is only a 64 percent chance of gaining any response from applied superphosphate.

Where the soil test was below 16 ppm only one of the 29 trials failed to give a response to superphosphate.

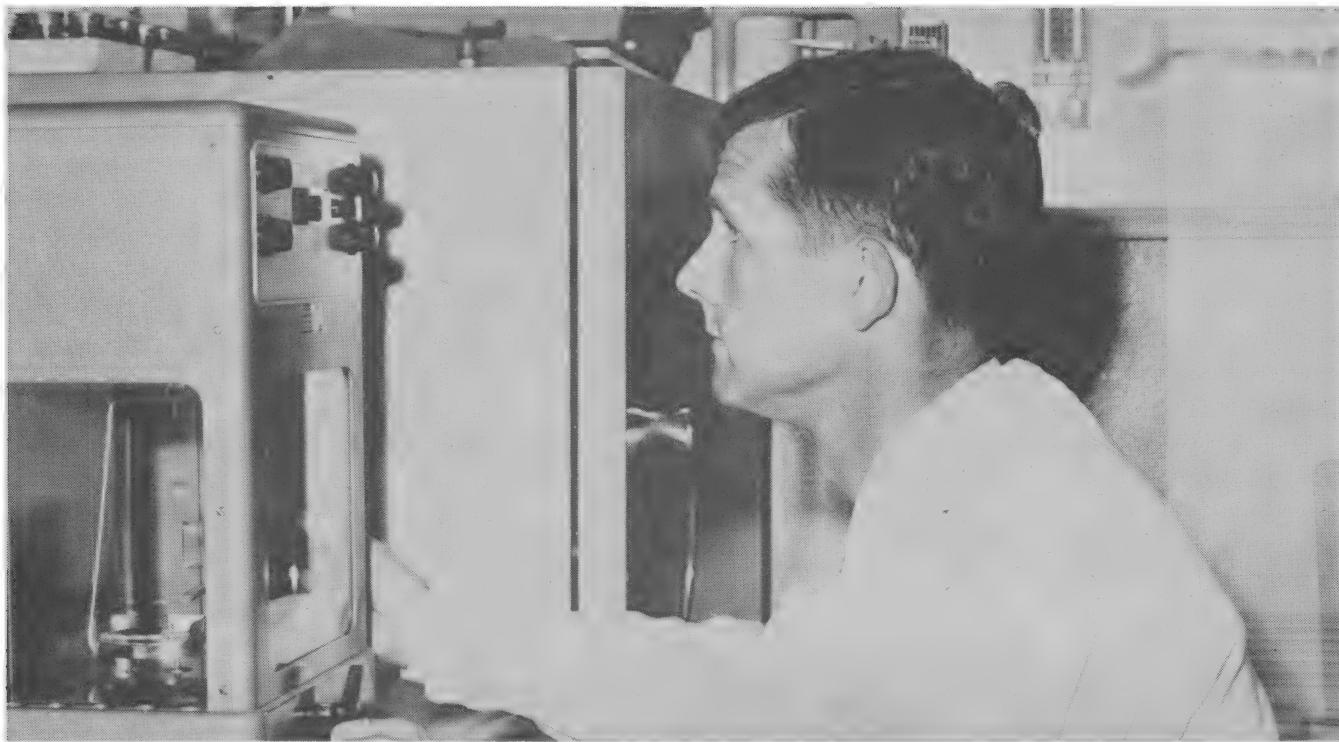
Thus the research results show that soils can be classified into at least three categories of deficiency by soil testing:

● Above 35 ppm soil phosphorus is adequate and no applied phosphate is required.

● Between 16 and 35 ppm soil phosphorus is marginal,

PHOSPHATE REQUIRED*		
Soil Test (sodium bicarbonate method) ppm	Probability of response to applied phosphate percent	Average super requirements for experiments in each deficiency zone.
0-5	100	3 cwt per acre
6-10	100	2.5 cwt per acre
11-15	100	1.5 cwt per acre
16-20	60	0.75 cwt per acre
21-25	60	50 lb per acre
26-35	60	10 lb per acre
greater than 35	0	Nil

*See text for the special categories for acidic red loams of Inverell with less than 36 ppm, a pH of less than 6.0 and responding to 3.5 cwt per acre of super; and the hard setting grey soils of Moree, which have a pH of more than 7.0, less than 26 ppm phosphorus, yet need only 60 lb of super per acre.



and yield responses to applied phosphate may or may not occur.

- Below 16 ppm soil phosphorus is deficient and yield responses are almost certain.

The second major limitation involved in the use of soil testing is in predicting the actual amount of fertiliser required to give the maximum economic yield. Here soil testing is less reliable than in predicting a simple yield response. Again we will illustrate this problem by referring to the original research results.

Of the nine experiments in the marginal soil test range of 16 to 35 ppm which responded to superphosphate, the amount of fertiliser required to give the highest economic yield varied from 28 lb to more than 400 lb per acre.

Two experiments in this range required more than 400 lb per acre — one had a soil test of 22 ppm and the other had a soil test of 30 ppm.

In the experiments on the very deficient soils containing less than 16 ppm phosphorus the best rate of superphosphate varied from 43 lb to more than 400 lb per acre.

Again there was little relationship between the best rate of superphosphate and

the soil test. For example in four experiments with a soil test of 10 ppm the best rates of superphosphate were 100, 155, 160, and more than 400 lb per acre respectively.

When we examine these research results in this way we cannot avoid the conclusion that soil testing has serious limitations for predicting fertiliser requirements.

The variability of the research data is such that a soil test can only be used as a rough guide to the phosphate requirements of a crop.

However it must be emphasised that it is the only guide we have, and if intelligently used it can make a big contribution to increasing the efficiency of fertiliser usage.

Fertiliser advisory services based on soil testing alone often overlook the importance of other environmental factors. A soil test value represents only one aspect of the chemical properties of a soil.

Other chemical properties and soil physical characteristics are not reflected in a soil test value. It is often found that soils belonging to a specific group — commonly known as a soil type — have similar chemical and physical properties. Thus if the soil type, as well as the soil test value, is known some of the

odd results based on soil testing as a single criteria can be eliminated.

Two specific examples of this have been found in northern NSW wheat belt soils.

The acidic red loams of the Inverell district sometimes have relatively high soil test values — up to 30 ppm — and yet give profitable responses to very high rates of super of more than 400 lb per acre.

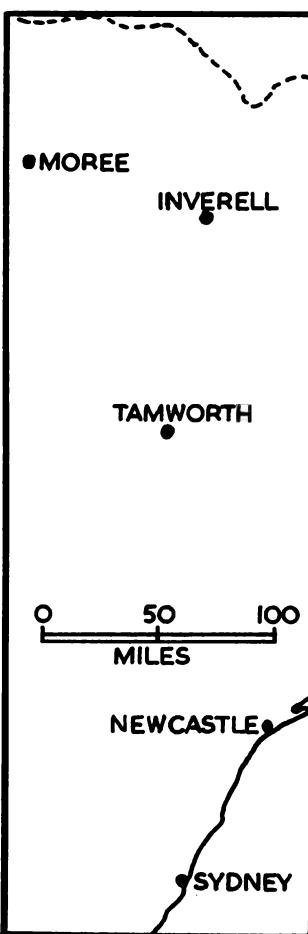
At the other end of the scale are the very hard-setting grey clays of the Moree district which usually have very low soil test values — less than 10 ppm — but do not require more than about 60 lb of super per acre.

Research into diagnostic techniques for predicting the fertiliser requirements of crops is continuing and there is little doubt that some of the problems involved in the use of soil testing will be solved.

At Tamworth Agricultural Research Station differential requirements for fertiliser by different wheat varieties are being studied as well as the effect of seasonal conditions on yield and fertiliser.

In conclusion I would like to present a table which can be used to interpret a soil test result of phosphate. Variability of research data precludes finer predictions than those on page 60. □

Soil samples are checked at the Tamworth research station by research officer, I. C. R. Holford.



PROBLEM FREE CONTRACT

Two contractors in northern NSW have turned a district and community problem into a sound business: and provided a valuable farm service.

IN the cotton country around Wee Waa, NSW, there are two young men who must have read Marvin Small's book "How to Make More Money". They are applying Small's principle that "to find a need and fill it" is the secret of success.

These young men found a need and are now occupied in filling it. If their progress

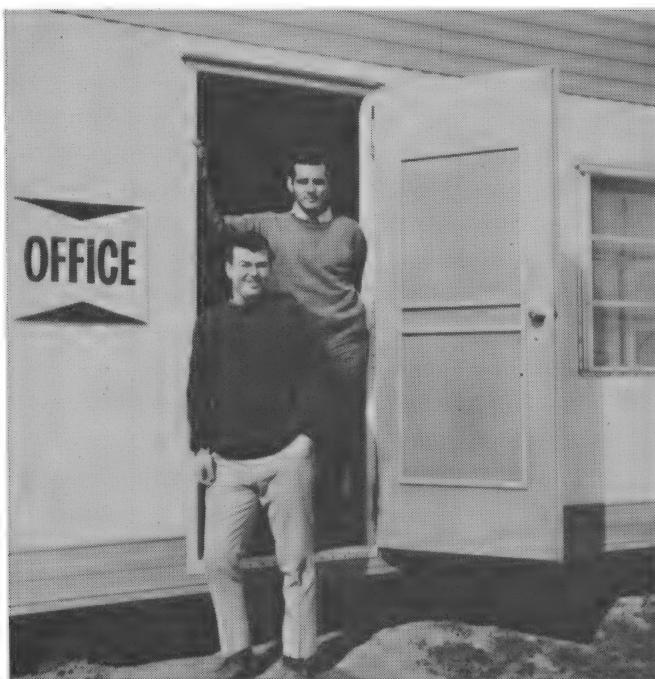
is any indication, they are well on the way to success. Here is their story as they told it to me.

Ross Pratley and Peter Hendriks were partners in a chipping contract on the cotton properties in the Wee Waa district. Ross is an Australian born in Burwood, a suburb of Sydney. Peter is a Dutchman born in Leyden,



Ross Pratley and Peter Hendriks stand in the doorway of their office, which was modified from one of the typical living units.

The general layout of the Wee Waa workers camp. Sleeping units are at left, while the buses parked by the "green".



Holland. Both are married with four children.

To obtain workers for their chipping contract Peter and Ross used to go to the camps on the bank of the Namoi River. Here was to be found a collection of men who had wandered to the district in search of work. The white men came alone but the Aborigines brought their families.

There is no accommodation on the riverbank. Food is cooked in the open and beds are the ground under trees. There is a tendency under such circumstances for men to neglect proper food, so many available workers were in no shape to do the work required.

Allied to the chipping contract, which consists of chipping weeds from between the cotton rows, Ross and Peter had a bus run based in Wee Waa, to transport rural workers to and from their jobs daily.

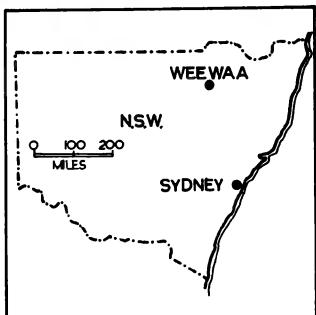
Peter saw the need for organising itinerant rural labor. He and Ross formed themselves into a company — Pratley and Hendriks Pty Ltd — and established themselves on the outskirts of Wee Waa.

This was two years ago. Up to that time there were about 25 labor contractors working principally from the river bank.

Peter and Ross started with 24 sleeping units for their workers, each containing two beds with ample room for gear. The units were erected around a central space of grass and trees, which reminds me of a village green rather than a camp. A kitchen, shower block and laundry facilities were established with the original units.

Building was in the hands of a Canadian company, with a branch in South Australia, called Wowic Industries, a breakdown of World Wide Camps. The construction is of mahogany ply with aluminium windows and aluminium fly doors.

In the unit I inspected was a guitar, a fox pelt tacked to the wall, fishing gear, books



and personal bits and pieces. The place was tidy, and this is not the responsibility of the tenants as a cleaner is employed to keep the units in order.

A staff of 11 looks after the workers and maintains the village. They now have 64 two bed sleeping units.

The project works like this. A man can come to the cotton district looking for work without a cent in his pocket. Provided he looks a decent type and passes the scrutiny of both partners, he is allotted living accommodation, given meals and use of all facilities, the cost of which is taken from his wages when he gets a job.

The residents of this camp are actually in the employ of Pratley and Hendriks, who have contracts with various farmers for labor. The workers are paid from the camp office and the property owner is billed for their work.

There is assistance given by the partners in many ways to their workers, including banking facilities. Residents are usually between the ages of 18 and 58 years, although one worker is considerably older and is one of the best heavy equipment drivers on the place.

Every kind of rural work is obtained for the men by Ross and Peter, from gardening and chipping through to tractor driving — and embracing everything in between. And jobs can be for one day to a week to months.

The workers from this camp are taken by bus and returned home free of charge. And the fleet of buses is a noticeable feature of the camp.

LABOR

By K. LLOYD

There is neither color nor creed discrimination in the village. The only requirement is that the men help themselves and are prepared to live amicably with others. The only rules are those which are necessary to preserve order and decency. One of these is, no liquor in the units.

This rule brought before the partners the need for provision for recreation. Here they were faced with a problem. They had to decide whether they would complete the extensive dining, canteen and kitchen project as they had initially envisaged it, or whether to cut it down and erect a recreation room.

They decided to build the food block as at first planned. This contains a large dining area with numerous tables and chairs of modern style and plenty of windows. A small shop has been built into one corner. A long serving counter caters for a good number at a time, and the kitchen is equipped with large ranges, plenty of cupboards and racks and a cold room.

The planned recreation unit is to be 50 ft by 30 ft. It will contain two billiard

The central grassed space at the camp provides a recreation area for the workers employed by Pratley and Hendricks.

tables, two table tennis tables, four dart boards, six card tables, as well as other tables for reading, writing and so on. This will, the partners hope, also include a wet bar, very necessary to overcome the problem of drinking in units.

This is a camp for men only and the residents tend to stay. One man arrived before the units were built. He bunked down on the site and cooked his food in the open until the kitchen was ready. He is still living there.

During the chipping season on the cotton, from November to February, many university students come to find vacational work and live in the village.

The project can be rightly called a workers' pool. It has, however, been expanded to cater for the essential needs of the worker in addition to obtaining work for him.

The foregoing suggests that the service is exclusively for the rural worker, but this is not so. Farmers in the area benefit from their contracts with Pratley and Hendricks equally in the following way.

In the past, property owners were obliged to erect extensive accommodation for itinerant rural workers which might be used for only a few days in a season.



The laundry at the Wee Waa camp. A showerblock, kitchen, dining hall, shop and recreation area are also provided.

This is no proposition for the farmer.

Now he can apply to the camp for a man for any job except staff positions, with the added advantage that his employee is brought to and from his property but lives in the camp.

If a worker is sent to a farmer and proves unsuitable, the farmer can terminate the employment immediately and ask for a replacement. He can take several replacements until he is satisfied that he has the man for the job, at no extra cost for the replacements. He need not have the trouble of making up wages which are paid from the camp office.

The whole scheme is really an extension of the

original chipping contract in which Ross and Peter were partners. They know all the problems from the points of view of the employer and the employee and are therefore in a good position to deal adequately with them.

The partners insist upon a spirit of integrity on the place and recommend their workers to the farmer by standing behind the work their employees do. Until the farmer is satisfied that he has the right employee, they consider the job not completed.

I think of the camp as a village. It is the most attractive worker's camp I have seen. The workers are not stranded in their units. They can use the central space under the trees, or relax in the dining area.

I told Peter and Ross when I interviewed them in the office that it seemed to me more than a camp and more workmanlike than a village. They said they had been tossing about various names for some time, because they felt this way about the place. They now think they may call it Honiara — a Hawaiian name meaning Eastern Breeze.

The accompanying photograph of the two partners standing in the doorway of the office will give an idea of the appearance of the sleeping units, as this office is a typical two-bed unit converted for their purposes.

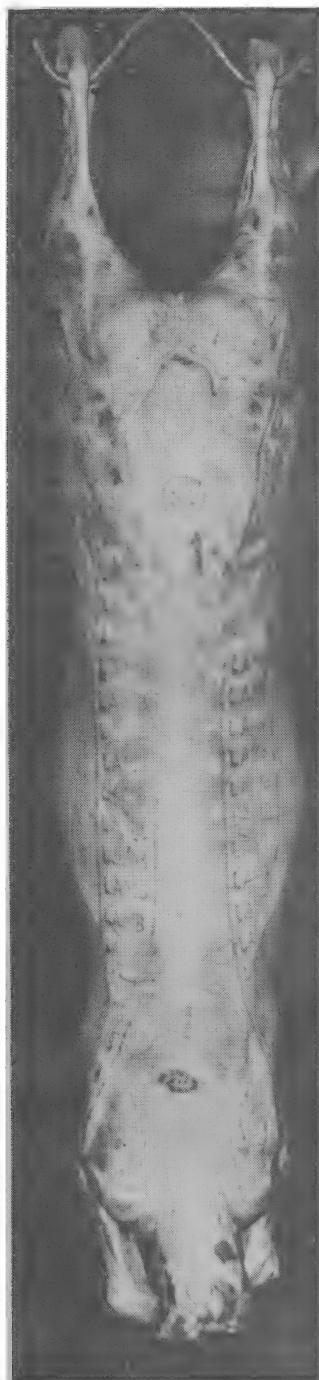
This camp caters mainly for workers on the cotton properties which are putting greatly increased acreage under cotton each year. But it is a flexible project which could be successful in any rural area of Australia. □



WHY LAMB PRICES WERE LOW

By J. FOTHERINGHAM

NZ lamb has been blamed for the current ills of our prime lamb market — but what are the facts?



Why did the bottom fall out of the market for quality lambs last year? According to this report a boom in production was the cause, not imports from NZ.

AVERAGE Australian sale-yard prices for lamb plunged to a seven-year low last financial year. The average monthly lamb price at Homebush, NSW, for the year was 17.5c a lb, and the average at Newmarket, Vic., was down to 16.9c a lb.

These prices were at least 4.5c a lb lower than for the past five years or so.

Disgruntled lamb producers have been searching for a culprit on which to pin their woes. Imports from NZ have taken more than their fair share of blame. However, this claim has to be analysed objectively.

The import duty on NZ lamb was eliminated in January, 1968, under the provisions of the NZ-Australia Free Trade Agreement. Despite the plaintive cries of local producers, lamb imports from NZ totalled 970 tons in 1968. Last year imports from NZ ran at not much more than one-sixth the 1968 rate.

The truth is that Australian lamb producers need look no further than inside their own boundary fences to discover the cause of their problems.

The reason for the price plunge last financial year was, quite simply, the record level of lamb production at home. The trend in total Australian lamb production over the past decade tells the story:

Year	Tons
1959-60	203,000
1960-61	207,000
1961-62	219,000
1962-63	231,000
1963-64	225,000
1964-65	224,000
1965-66	209,000
1966-67	237,000
1967-68	242,000
1968-69	302,000

The increase in lamb production last year was, in fact, the biggest increase recorded in a single year for more than 30 years.

The reasons for the increase — interesting though they are — do not concern us here. It is the impact of the increase that is of immediate interest.

An important assumption has already been made: that the level of supply is crucial in determining price. However, this assumption needs careful examination — as does its practical effect.

The interplay of supply and demand are the clichés of economic theory. Unfortunately, in our real world information on supply and demand — when it is available, which is not often — rarely provides practical help in determining market prices.

However, with lamb marketing in Australia, economic theory comes very close to paralleling economic reality. In fact a quite remarkable correlation appears to exist between supply levels and price.

Look closely at the two graphs. No economic theorist could ask for a better price: supply correlation. As supply goes up, so price drops — and vice versa.

Before the sceptics leap in, some words of explanation are necessary.

First, it must be admitted that the vertical scales have been so placed as to equate, as near as possible, the height and depth of the curves. This is done not to mislead but to show as graphically as possible the true correlation that does, in fact, exist.

Second — and most important — total monthly slaughtering have been confronted by monthly prices at the two major selling centres for 1st and 2nd export quality lamb. This is an arbitrary choice.

This quality of lamb was selected because all prices are related, and the price of top grade lamb is likely to reflect most significantly the impact of supply factors.

But I think it is unnecessary to get bogged down by

the niceties of economic argument.

The spring flush of supply paralleled by the price decline, and the winter shortage and price lift is clearly apparent in the graphs for both Victoria and NSW for the entire period covered by the graphs — with the much greater extremes in Victoria an interesting sidelight.

Thus, I think, we can arrive at a fairly firm conclusion: the level of lamb prices appear to be determined very largely by the level of supply coming on to the market. And if production is going to continue to increase we can expect no escape from the downward spiral of prices.

Per capita consumption of lamb in Australia has not changed much over the past 10 years. The average for this period is around 40 lb per head per year with a range of between 38 lb and 43 lb — but with no significant trend towards increase or decline.

To feed our growing population we need an annual increase in production of around 5000 to 10,000 tons a year. Last year, as we have seen, production increased by 50,000 tons — with the somewhat disastrous result to prices.

Meat board chairman, Jack Shute, was recently upbraided for casting gloom on future lamb export prospects. Produce for the home market, was his advice.

And, on the information available, he's absolutely right.

Until last year it had seemed that the Australian lamb industry had decided on this course of action without prompting from the meat board. Lamb export tonnages had dwindled from 23,800 tons in 1964-65, to 16,300 tons in 1965-66, to 14,400 tons in 1966-67, and down to a miserable 8,800 tons in 1967-68. And market watchers started predicting the complete demise of the Australian lamb export industry in the very near future.

Then last year's export boom came to take everyone by surprise — 29,800 tons exported, a 10 year peak.

But is lamb export profitable for producers? The answer is frankly "No." Certainly export prices have

not declined significantly over the past three years or so — but neither have they improved very significantly.

Lamb exporting has been profitable for some exporters from Australia during the past 18 months or so. But only because they have been able to buy up local supplies at such a low price. And, as we have seen, these low ruling prices result from the over-supplied market.

To be brutally frank, lamb producers are cutting their own throats.

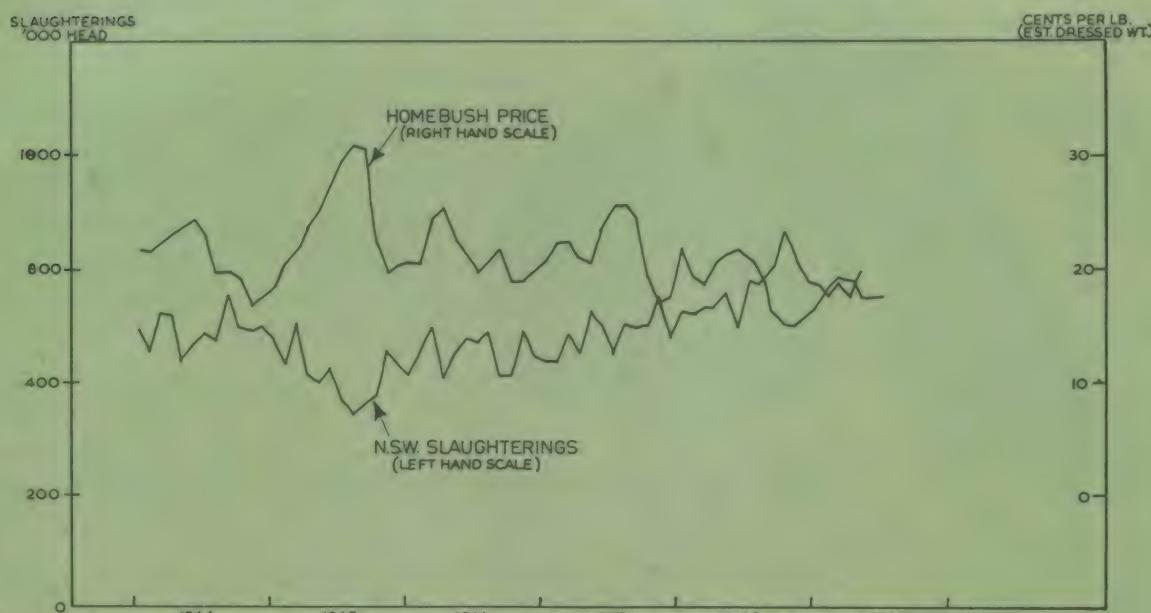
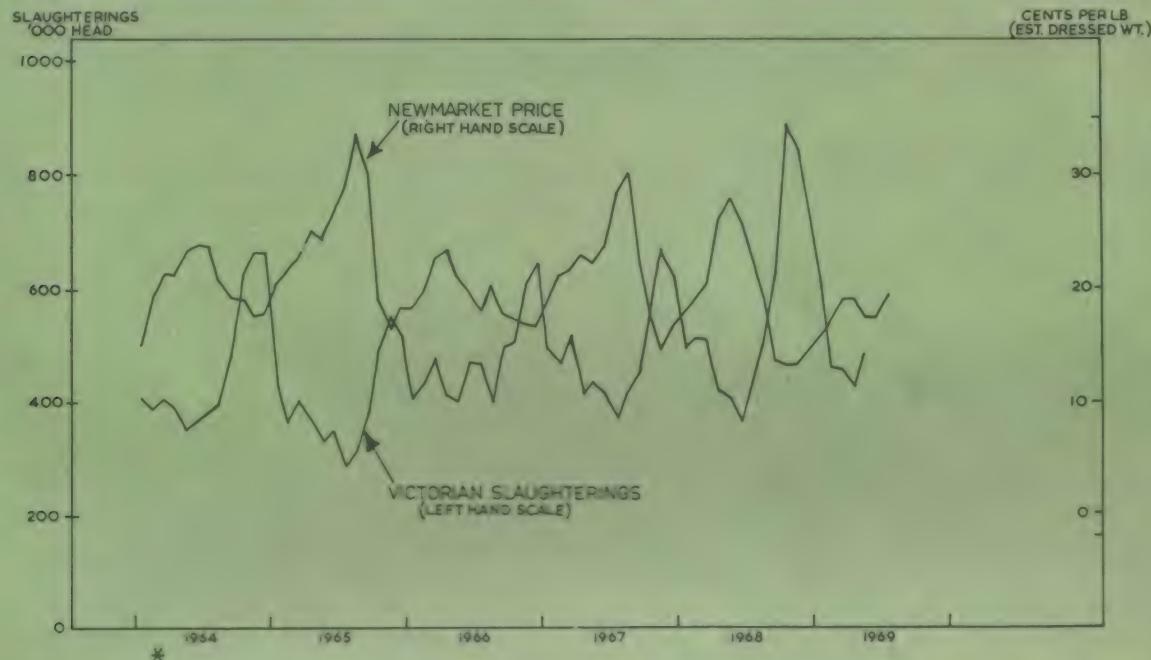
It is probably — certainly

— impractical to suggest some form of organised or co-ordinated production plan for lamb. An organised marketing plan would — on the face of it — seem almost equally impracticable.

But it's a start to know the source of the trouble. Even if the cause is so apparently simple.

By highlighting the real cause of the problem, at least a step has been taken towards a solution — even though it may not be a happy one for many prime lamb producers. □

THE LAMB MARKET IN AUSTRALIA



SOURCE: SLAUGHTERINGS — COMMONWEALTH STATISTICIAN, PRICES — AUSTRALIAN MEAT BOARD
* MONTHLY FIGURES FROM JAN. 1964 TO JULY 1969 PRICES FOR 29 36LB 1ST AND 2ND EXPORT QUALITY LAMBS

NOW IT'S THE BIRDS, BEES AND HELICOPTERS

The agricultural chopper in the USA is more than just a means of getting from point to point — here are some of the odd-ball jobs given them.

AN American pilot, Bill Cole received a request from a local vegetable grower for two choppers to fly over his crop of tomatoes one frosty morning. The mercy mission cost the grower \$1000 but he reckoned it was worth every penny of it. The frost would have wiped the entire crop out and the saving of a \$50,000 crop for an expenditure of \$1000 is good economics.

Other work carried out by Cole and compatriots includes patrolling fence lines, spotting cattle in rough ter-



rain, picking out valuable hardwood timber which is difficult to find from the ground, carrying hay in to snow bound cattle; aerial photography for soil surveys, crop disease detection, irrigation development and livestock and wildlife inventories.

One of the wildest stories concerning helicopters was recently told in John Deere's

Furrow. It also concerned Bill Cole and his choppers.

John Golden, a maize seed grower of Cordova, Illinois called on the service of Cole to create air turbines. There was little natural wind at the time and Cole flew at about 10 ft height at 30 mph. The downwash from the helicopter caused the corn tassels to shed on to the waiting co-

pilot who, an American pilot, was flying his helicopter along the rows of corn, causing air turbulence and helping pollination and growth of the crop.

Explaining the process, Golden said, "Sometimes the wind just dies and we are working with individual ears of corn that are potential pollinators, even though their offspring make inferior corn seed."

So now the corn fields seem to be the same, but the birds and the old fashioned

□



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TOP END BEEF ROADS GROW EAST AND WEST

Late this year a beef road will be finished in the Top End: a road which could play a major part in doubling stock turnoff from the area served.

COMPLETION of the Anthony Lagoon-Borroloola beef road late in 1970 will provide a 470 mile sealed road serving 42,000 sq miles of cattle country. This land is east of the Stuart Highway.

A \$970,788 contract was awarded recently for the construction of the last section of 48 miles of the 161 mile Anthony Lagoon-Borroloola road. This will join the Daly Waters-Cape Crawford and Anthony Lagoon-Barkly Highway beef roads.

This development will provide a sealed link swinging in a rough arc from the Stuart Highway to the Barkly Highway.

The complete road will then begin at Daly Waters, 400 miles south of Darwin on the Stuart Highway, and end at a point on the Barkly Highway some 130 miles from its junction with the Stuart Highway near Tenant Creek.

By the time the last section of the new road is completed the 470 mile link will have cost the Commonwealth Government some \$11.5 m. Work on the overall project started in mid-1967.

The \$970,788 contract awarded recently went to the Darwin civil engineering firm of Interconstruction Enterprises. The Department of Works constructed 10

miles of the Anthony Lagoon-Borroloola road, and Dillingham Constructions is building the other 103 miles.

Another firm, Steelcon Constructions, is building the nine bridges needed on the road. The Anthony Lagoon-Borroloola project is expected to be finished towards the end of 1970, at a total cost of more than \$5 m.

The Anthony Lagoon-Barkly Highway road has been completed and the Daly Waters-Cape Crawford link is in the last stage of construction.

Distance from markets and poor roads have severely handicapped some graziers in the region to be serviced by the 470 mile link between the two highways. Huge areas are underdeveloped but the road should lead to a considerable rise in stock numbers and improved management.

There are 22 properties in the area, ranging in size from 4730 sq miles to 547 sq miles. Their present cattle population is 169,000 but it has been estimated the country could support 287,000.

Annual turnoff is 26,000 head but development and improved management could increase this figure to 56,000.

Today most cattle are sent to Darwin, Katherine and Queensland abattoirs but it

is believed that when the road is completed nearly all will go to Darwin and Katherine. The Katherine abattoir is being rebuilt following the fire last year.

The new road is important for other reasons. It cuts through mountain and lagoon country and the open grasslands of the Barkly Tablelands, and will open up new territory for tourists. It will also prove of major importance should the decision be made to go ahead with development of lead, zinc and silver deposits in the McArthur River region which the road skirts.

In other recent beef road

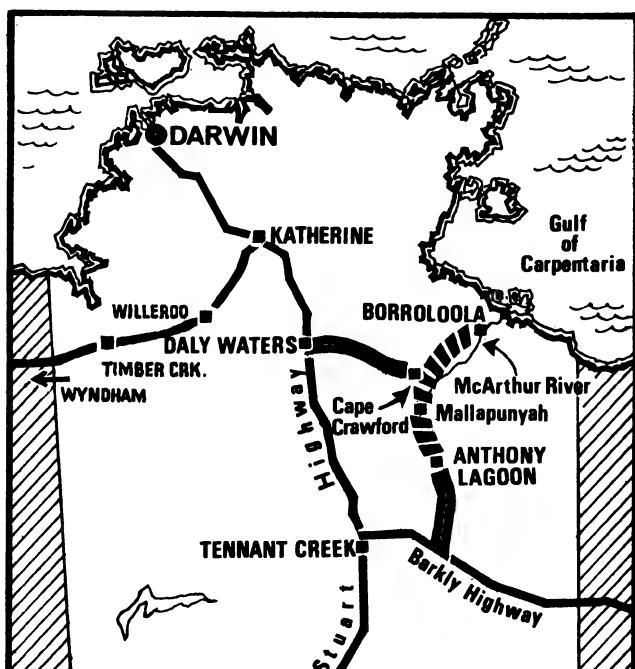
moves in the Top End, contracts totalling almost \$300,000 were let for work on the Willeroo-Timber Creek section of the Victoria Highway west of Katherine.

Interconstruction Enterprises won a contract for \$194,254 to construct about eight miles of sealed beef road. The other contract—for \$97,319—went to Rossana Earthmoving of Katherine for work on the Willeroo-Victoria River section.

Some 75 miles of the Katherine - Willeroo road have been sealed, while the section from Willeroo to Timber Creek will add another 98 miles of sealed beef road costing \$3.35m.

Of the 98 miles, 81 will be new construction and 17 miles will be sealing existing gravel roads. From Timber Creek the gravel beef road crosses into WA, ending at Wyndham.

The other 90 miles of the Willeroo-Timber Creek section are being constructed by Department of Works day labor. Work on this section is now scheduled for completion at the end of 1970. A contract has been let for a \$350,000 two lane bridge spanning the Victoria River and work is under way. The bridge will be 450 ft long. Contracts for nine smaller bridges on the Willeroo-Timber Creek road will be let shortly. □



SA'S BEEF TESTING

It required a lot of courage, and a lot of conviction, to launch into beef weight gain testing back in the dark days of 1957 in SA.

By H. PARKER

WHEN Dick Kidman let it be known 13 years ago that he was going to weight record his stock, he met with resentment, suspicion, and actual antagonism, from people in the beef industry.

"I've always been a radical," he says. When Agriculture Department beef husbandry adviser Ron McNeil was looking round the State for suitable herds on which to try out his reputedly crackpot ideas, he came to Kidman's stud Monbulla, near Penola in South Australia's south east. "Without knowing I was doing it," Kidman says, "I had unconsciously been selecting my Shorthorns for muscling, and Ron liked the look of them.

"That was in 1957. When you've decided to go on to this scheme, it takes quite a time to get your herd ready, and we actually started weighing in 1959. We were known as 'that lunatic Kidman-McNeil', and some people still regard us that way." (See COUNTRY, December, 1969, page 18.)

Anyone interested in carcass competitions knows just how sound the practices of "that lunatic" have been proved to be.

Kidman exhibited the best Shorthorn carcase at Portland in 1964 and 1967, and the best Poll Shorthorn carcase in 1966 and 1967.

At Melbourne Royal Shows his stock twice gained first prize for three steers by one sire, giving the highest daily carcass gain over all breeds, in 1966 and 1967. These were sired by Monbulla Financier.

A Monbulla steer was equal champion at Smithfield, London, when steer classes from 1965 Melbourne Royal were sent there.

For six years Monbulla has conducted a production sale on the property, the selling agents being Dalgetys, Southern Farmers' Co-operative, and John McDonald of Sydney. About the same

number of cattle have been sold each time, but cash returns have lifted consistently. In 1962, 63 cattle sold for \$10,500. In 1968, 60 cattle sold for \$17,520.

How has this progress been achieved?

Performance testing commenced in 1957, with 70 cows and three bulls. Economically significant traits were the ones given priority in the program — fertility, weight-for-age, and conformation for muscling.

In order that environmental factors should be consistent, all calves were raised on their own mothers on pasture.

Calves were weighed at weaning, and at 12 months, and entire males again at 21 months.

Two-month-old heifers on Monbulla with their poll and horned dams. These calves are by Monbulla Magnitude. One of Kidman's top Shorthorn sires.

Lakeside Academic by Newbold Blender's Barnabus was bought for the Poll Shorthorn stud at the 1965 Adelaide Royal Show.

Herd recording was established so that the performance of sires, on the basis of growth rate of their progeny, could be compared. At the same time cows were classified by their ability to raise fast growing calves.

All carcasses were sold on the hook, and by this means daily carcass weight gain, and proportion of red meat and fat, from each beast, could be ascertained. As research showed that muscling and fat coverage were highly heritable, this was important data for the scheme.

Dick sells steers at about 15 months. His practised eye judges when the animal has reached the required state of finish to supply the limited

amount of fat required by the meat trade.

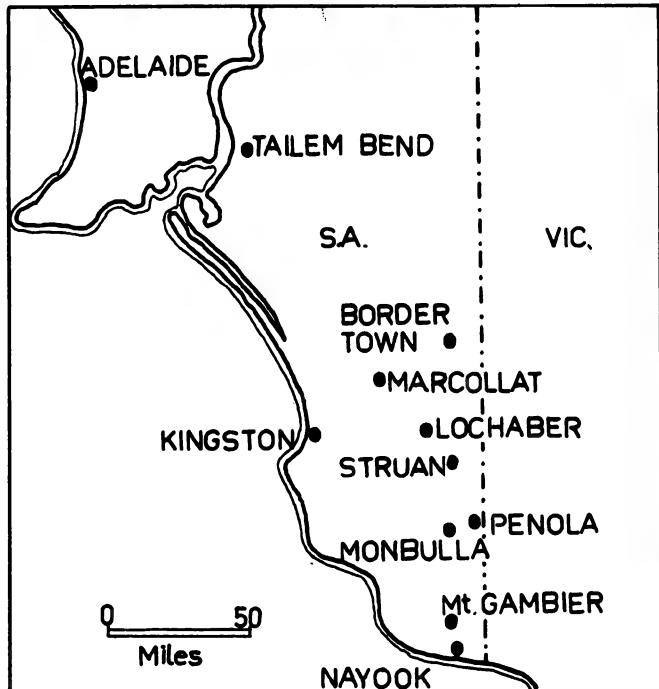
The eye muscle is used as the criterion for the whole carcase. In 1960, eye muscles on Monbulla carcases measured 45-50 mm. 1.8 to 2 in. Today they measure 65 mm — more than 2.5 in.

Early in the program Monbulla Financier was bred. He was found to be a top growth rate bull, capable of passing on this characteristic to his descendants. As many as possible have been retained in the herd, in order to continue the trend.

Cows are graded for muscle development, and high growth rate bulls are mated to the heavier cows



PIONEER



to improve fleshing qualities.

The herd now has 200 breeders. In order to achieve this gain, culling has been fairly light. This means that almost all females are carried through, steers are carried, usually, to 15 months, and about 50 bulls a year are retained for sale.

Dick uses bulls for an average of 1.5 years — an interesting commentary on the rate at which his herd improves. In effect, therefore, his top bulls become available to buyers after he has had one or two seasons use from them. They are thus released as tested in every way.

It would be difficult to work out carrying capacity of the property. Two hundred ewes are the only other stock. The soil is sand, swampy and inclined to water-logging in winter, with an average rainfall of 26 in.

Some 800 acres of the total 1100 carry the strawberry clover, perennial rye, and Mt Barker sub clover pastures. Paddocks are about 50 acres, the position of the fences being governed by the position of the swamps.

Recently, spray irrigation has been introduced on 120 acres, and demeter fescue has been sod-seeded into that area. This grass gives prom-



ise for the entire property, but Dick admits that, with only one other person employed, he can't give full attention to both pasture and stock — and stock come first. The fairly modest amount of 2500 bales of hay is cut each year, and no other supplementary feed is used.

One conclusion is obvious. The carrying capacity is increasing. Feed conversion rate is increasing. The ratio between cows and calves to the acre, and daily weight gain per acre, has settled itself at what is the most economic level, although this has not been calculated in detail.



Dick Kidman, owner of Monbulla stud near Penola in the south east of South Australia. He started weight recording in 1959.

Yearling heifers on Monbulla show their quality — the result of good stockmanship, and intelligent use of accurate records.

One problem is that of finding bulls to introduce from time to time to avoid in-breeding. Where possible, Dick buys from other performance tested studs, but none of these has advanced to his position.

Asked about ai for this purpose, he says, "I've travelled about a fair bit. Somewhere in Australia there must be a bull that would upgrade my herd, but I haven't found him yet."

A drive round the paddocks is a delight. Heifers, calving at just two years, have udders like dairy cows. They stand placidly while one admires their calves, a

few days old. Almost all calving on Monbulla is concentrated into eight weeks in autumn.

Individual muscles can be distinguished rippling on poll and horned sires as they move about their paddock, their backs as broad as table tops.

Thirty young bulls in a paddock are so quiet they do not move when the car approaches. They stand with the aplomb of fashion models to be photographed. Without exception the stock are quiet, indicating the gentle handling and personal attention they receive.

Dick says he knows his

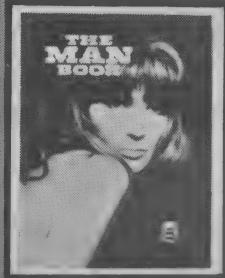
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THE FAMILY FISHERMAN by Vic McCristal.
\$2.95 at all bookstores throughout Australia.

cows individually. He can look at a cow and assess how she can be most advantageously mated to improve the line. His utter sincerity is self-evident.

Fifteen years ago he forecast the present problems of the sheep industry, and this influenced him towards stepping up his beef project.

The method of selecting bulls is relevant. The bottom half of the male calves in a drop is eliminated on eye appraisal. After the weaning weighing, the remainder are split into A and B groups. The A group is retained to two years, and the B group sold to regular clients in the Alice Springs area at 12 months.

Dick prefers to sell stock on the property. This, he points out, gives the buyer opportunity to compare and assess bulls which have been reared under identical conditions.

An assortment of bulls in a sale yard, over-finished, and brought in from a variety of unseen environments, gives no such means of comparison.

The small number of bulls which he sends to sales always make a talking point, and are one means of attracting new clients to his property. Regular buyers who attend the production sale, and a steady number of newcomers, find their way on to the farm.

EDUCATION

Invariably, their knowledge of performance testing is minimal, and Dick spends an average of four hours with each one, filling him in on the background of the new breed of beef animal he is contemplating buying.

This isn't the only sort of education disseminated from the Monbulk herd. Several times a year there are visits from parties of agricultural students. Dick enjoys these visits, finding it a pleasure to explain what he is doing to young minds which are receptive to new ideas, and quick to see the point in his methods of selection.

"People say, when they look at our herd in the paddock, that the cattle are small," he says. "The factor to look at is the amount of meat per animal, as compared with other environments.

"They're all converted the

day they come to our sale. We yard all our cows, that day, with their calves at foot. That's when people realise what we're aiming at. The whole objective is to wean the right calf."

Dick loves Beef Shorthorns. He prefers the horned ones, but maintains a one bull poll herd, because of public demand. He has a small project in hand in which he is going to mate a few dairy cows — Jerseys and Friesians — to a Santa Gertrudis bull.

No, he's not looking for hybrid vigor. He wants to demonstrate that, given similar environment, his Shorthorns are as good as any other cattle.

SHORTHORNS BEST

The Shorthorn, he says, has a lot of potential for muscling. His have almost reached double muscling, that condition where each muscle contains a great many more muscle fibres than average, but his present thinking is that he wants to stop short of this point, because double muscling brings with it fertility and genetic problems.

However, developments in the near future could alter his opinion. "You can never say, 'This is it... I'm going to stop here.' You never know what the next three or four years will bring to light."

It's the same with the eye muscle measure — he thinks 70 mm, about 2.9 in. — might be the desirable limit for him to reach, but new developments could bring a change in his thinking, or in what is possible.

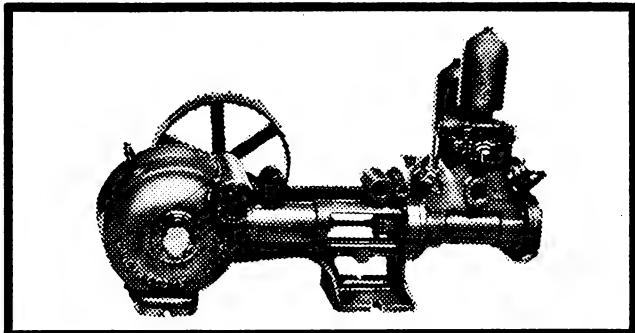
Dick Kidman has had the satisfaction of hearing some of his detractors admit they were wrong. He and his adviser are no longer labelled "That lunatic Kidman-McNeil."

He says he has learned a lot, and has greater tolerance and charity for people, since he discerned the differences in cattle.

But he will never say he has reached the ultimate in herd improvement.

For more details of the remarkable work of SA's Ron McNeil, see Heather Parker's report of his beef development program which appeared on page 18 of COUNTRY'S December, 1969 issue. □

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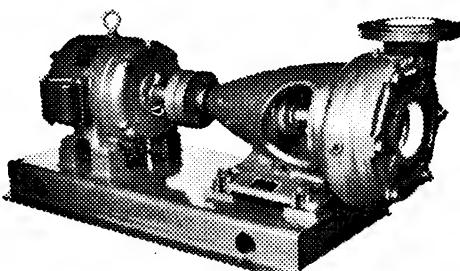
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GET THE MOST FROM BOOM SPRAYS

Boom sprays are just like cars — they often need a "tune-up" to get them running smoothly again and this can save you time and money.

By BRIAN TUCKER

IT is evident that as modern crop protection chemicals become more expensive, per unit cost, and their application rates more critical, careful attention must be paid to the equipment through which they are dispersed, particularly nozzles, in the case of boom sprays. Among the factors to be considered prior to selection of nozzles are — Type of pattern produced — The production of a high degree of turbulence within the nozzle body — its ability to produce an effectively sized spray particle — The ability to apply an exact amount of liquid per acre, under specified conditions.

Placement of nozzles must be carefully considered, to give overall coverage of foliage and the operator must have a thorough knowledge of discharge rates.

The three most common patterns produced by nozzles available today are the flat fan, the solid cone, and the hollow cone. The flat fan and solid cone nozzles find particular application for weed spraying, and soil spraying but are less suited to the application of crop protection chemicals. For this latter purpose, the hollow cone type is ideal.

This is because the turbulence produced within the spray cone induces swirling and promotes underleaf coverage — essential for the control of insects which are found mainly on the underside of leaves. Among hollow cone nozzles, those with a wide, 120 degrees spray angle have an advantage over those producing a 70 degree pattern, the latter type being more common. Obviously the former will cover a much greater area.

In addition to turbulence within the cone of liquid, the

spray must be maintained in a state of agitation within the nozzle body to prevent clogging problems, these problems being mainly due to the wettable powders. As the liquid passes through the nozzle it flows through areas of such small diameter that clogging can occur, depending on the volume of liquid moving past this point. It is at the orifice that this trouble often crops up. To compare various nozzles with regard to clogging tendencies, this factor has been expressed as a ratio —

nozzle capacity

diameter of opening

where nozzle capacity is expressed in gallons per minute and the diameter expressed in inches.

Ideally, this Clog Ratio should approach unity — 1:1 — and in some types such as the Monarch 49 X 49 Hollow Cone, Whirl Chamber, almost does so. With a capacity of 0.12 gallons per minute at 10 psi and an orifice diameter of 0.073 in., it

has a Clog Ratio of 1:1.6. Some types of nozzles in common use have ratios in the vicinity of 1:25.

The finer the droplet, the more effective the spray will be in controlling plant pests and diseases. First of all, however, there is a limit to which the size of the particle can be reduced.

Particles of spray smaller than 100 microns in diameter will be subjected to 100 percent drift, that is, no spray can be expected to reach the leaf. Optimum droplet size lies in the range 200 to 500 microns. A micron, incidentally, is 0.0001 cm, and there are 25,000 microns to the inch. As a reference, the borderline between cloud and drizzle is 200 microns.

As the particle size is reduced, a greater surface of liquid is available to wet the leaf. A spray having a droplet size of 300 microns diameter, will produce about 72 droplets to the square inch. These will be spaced 0.12 in. apart, so we can see that by the time these drops have become flattened and spread, due to atmospheric pressure, very little leaf is left uncovered.

With a larger droplet, surface tension of the liquid offers a greater resistance to spreading with the result

that the spaces between drops are not filled nearly so readily. In addition, a larger particle has a higher tendency to roll off the leaf, especially on plants that are hard to wet.

The fourth consideration, ability to apply an exact amount of liquid per acre, under specified conditions, is almost directly related to the quality of the nozzle. A nozzle which wears will with the continual passage of solution or suspension, or even plain water, gradually deliver a greater quantity of liquid per acre. This results in a larger amount of concentrate being applied, and hence, needless expenditure.

The chemicals most notorious for nozzle erosion are wettable powders. However, erosion can also be caused by the abrasive action of minute particles of metal, rust and dirt which could be present in the spray tank. This is easily rectified by fitting a new tank preferably, or at least, a suitable strainer.

Erosion by chemicals can only be stopped by using nozzles which will resist such

Booms must be mounted rigidly and they must always be set so that they are parallel to the ground to ensure even distribution of the chemicals being applied.



chemicals. Nozzles, both body and tip of which have been cast from stainless steel are less prone to attack. Practical trials have shown that a stainless steel nozzle will produce a uniform pattern for a period of time and last about five times longer than brass.

In addition to inaccurate application rates, an eroded nozzle will produce an uneven spray pattern. Areas of leaf will receive only partial coverage, while other areas will be literally soaked. Apart from the reduction in chemical efficiency, phytotoxic chemicals are liable to damage parts of the plant.

While on the subject of uneven patterns, growers should exercise care when handling nozzles. A nicked

An even spray pattern is essential if the money spent on chemicals and labor is not to be wasted completely on useless operations which fail in their objective.

orifice produces an uneven pattern, even if the body of the nozzle is sound. It should be borne in mind that although a particular nozzle may have a higher initial cost, it will invariably prove more economical in the long term.

The necessity for correct placement of the nozzle orifice, in relation to the plant, is apparent. This can only be done by trial and error, testing the nozzle or nozzles in various positions, and noting the amount of liquid that reaches the leaf, and the degree of coverage gained. As mentioned earlier, the underside of the leaves must be observed to ensure that this area is also receiving adequate coverage.

The boom is perhaps the

Because this boom spray is set at a long distance from the ground, droplet size must be sufficiently big to prevent losses through evaporation.

most important aspect of any spray program, since it controls the effectiveness, as well as economy of the operation. The factors governing the output of a spray boom are —

- Boom width, or width of sprayed area —
- Ground speed of tractor —
- Pump pressure, and —
- Required application rate of chemical, per acre.

Before a boom is calibrated, the nozzles should be removed and sufficient water pumped through the lines to remove any dirt or metal shavings. Hoses should be checked for leaks and the seal of the spray tank lid inspected, as well as the tank itself.

The tractor or vehicle carrying the gear should then be moved to an area of relatively flat ground, and the spray tank filled to any

convenient level and this volume is recorded. It is also advisable to mark the position of the tractor.

A strip of ground, 290 yards long is then paced, or measured, and this strip is sprayed under actual operating conditions. Tractor speed and pump pressure are recorded for the future. The unit is then moved back to the position in which the tank was filled, and the tank refilled to the original level and a note made of the volume required.

Another run can be taken if desired. If the results of the two agree closely, take the volume of liquid used as being the average of the two runs.

The amount of water required to spray one acre, be it blanket application, or band application — in which case only one acre will be sprayed out of a possible two or three covered — may be found as follows —

Gallons per acre equals gallons required to fill tank multiplied by 50 and divided by the width of sprayed ground, in feet and the result is called "A".

To determine the quantity of concentrate to be added to each spray tank — multiply the capacity of tank by the application rate per acre and divide the result by A.

Until the nozzles wear, or the pump wears, or either of these are replaced, this procedure need not be repeated.

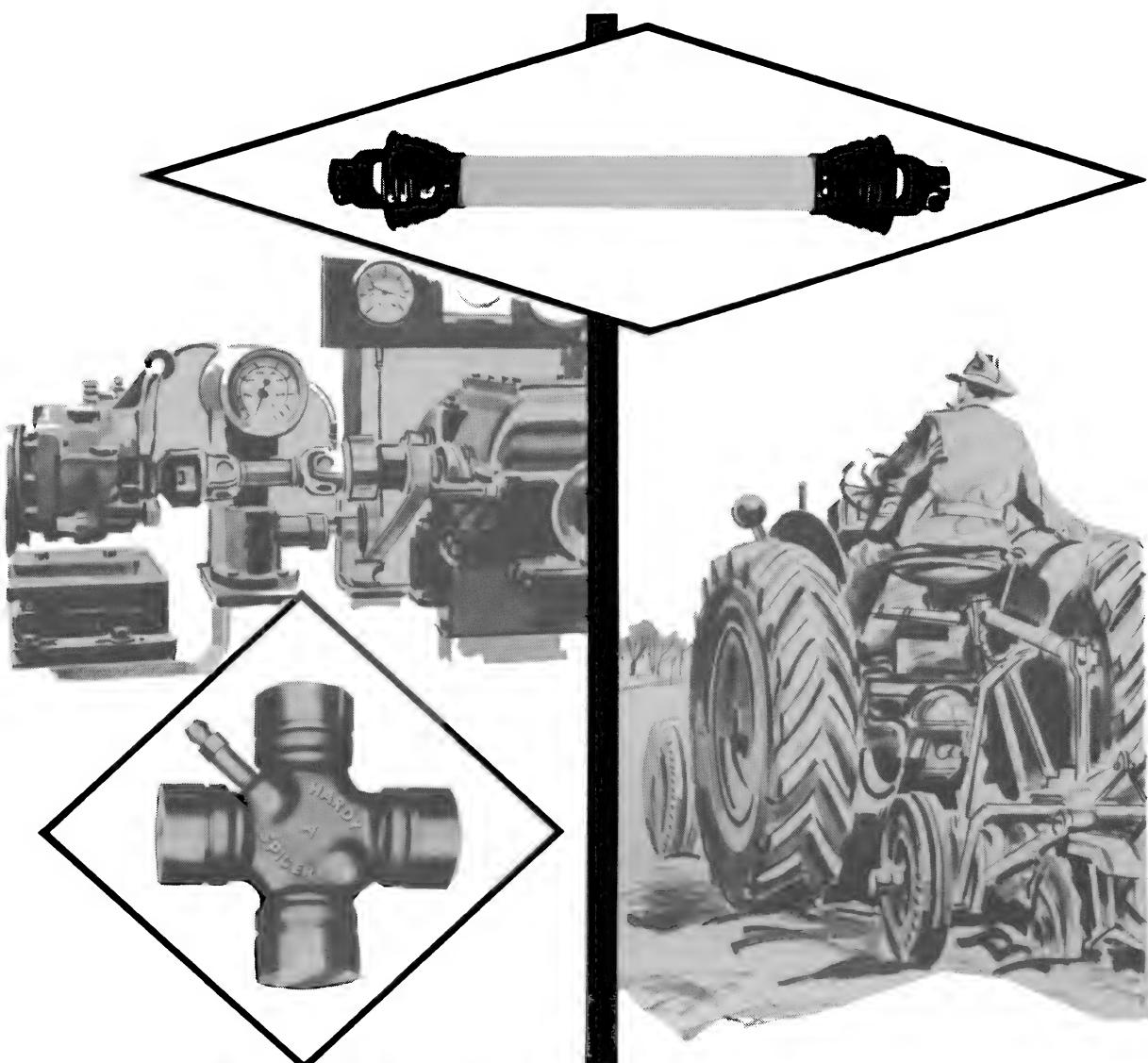
To determine the capacity of the pump needed for a boom, use the following method. At your usual operating pressure, collect the liquid discharged from one nozzle for one minute.

Gallons per minute equals quantity collected in ounces multiplied by the No. of nozzles and divided by 128.

It is then necessary to check the pump specifications to ensure that it will handle the volume required. Adequate by-passing must be allowed for, also the possibility of extending the boom at a later date. This will ensure that you do not purchase a pump of insufficient capacity.

Over a period of time, attention to these points can result in a considerable saving in chemical, with the knowledge that accurate, effective spraying is being achieved. □





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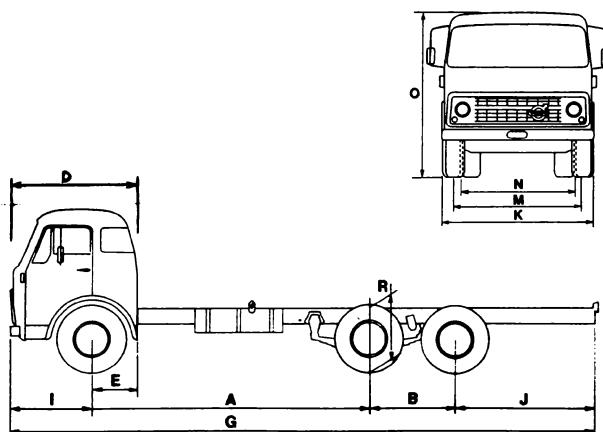


By COL BEGG

COUNTRY
MOTORS &

LUXURY ON 10 WHEELS

Sweden's range of trucks is fitted in a luxurious way but they still have all the properties to make them suitable for Australian agricultural work.



VOLVO FB 86 SERIES DIMENSIONS
(Priced from \$15,370 including sales tax)

Dimension	FB 86-34	FB 86-38	FB 86-42	F 86-49
A	134	150	165	193
B	52	52	52	52
D	75 $\frac{1}{4}$	75 $\frac{1}{4}$	75 $\frac{1}{4}$	75 $\frac{1}{4}$
E	26 $\frac{1}{4}$	26 $\frac{1}{4}$	26 $\frac{1}{4}$	26 $\frac{1}{4}$
G	294 $\frac{1}{4}$	321 $\frac{1}{4}$	348 $\frac{1}{2}$	398 $\frac{1}{4}$
I	49	49	49	49
J	58 $\frac{3}{4}$	70 $\frac{1}{2}$	83	104
K	92 $\frac{1}{2}$	92 $\frac{1}{2}$	92 $\frac{1}{2}$	92 $\frac{1}{2}$
M	75 $\frac{1}{2}$	75 $\frac{1}{2}$	75 $\frac{1}{2}$	75 $\frac{1}{2}$
N	68 $\frac{1}{2}$	68 $\frac{1}{2}$	68 $\frac{1}{2}$	68 $\frac{1}{2}$
O	100	100	100	100
R	37 $\frac{3}{4}$	37 $\frac{3}{4}$	37 $\frac{3}{4}$	37 $\frac{3}{4}$

THE body styling of the Volvo will never win a beauty award, but once inside the operator's cab, the Volvo starts to shine. Every conceivable effort has been put into making the driver's task a more pleasant one.

Such items as air conditioning, servo boosted steering, infinitely adjustable seating, a co-ordinated suspension system and a host of other features are found as standard equipment on these trucks.

The Volvo range of trucks includes semi-trailer prime movers as well as the dual wheel, double bogie, single driving axle type cab and chassis, which can be fitted with your own special body design.

The 86 Series models are powered by a six cylinder diesel engine fitted with a turbo-charger. The engine is specifically designed for turbo-charging and has seven bearing crankshaft and two cylinder heads, each covering three cylinders, which are fully interchangeable. The wet type cylinder liners are fitted with sealing collars and a stepped edge for maximum sealing efficiency. Compression in the Volvo engine is relatively low, resulting in less bearing stress and low top end pressure.

The turbo-charger is an exhaust driven type compressor, boosting the engine's output to 195 hp at 2500 rpm. With normal operation, the output is 160 hp at 2500 rpm.

Transmission on the Volvo 86 Series consists of a basic four-speed gearbox with high-low reduction, providing eight speeds overall. High and low speed ranges are selected by actuating a small toggle switch on the gear lever. The low range is used for speeds up to about 12 mph then the high speed ratio is selected for normal road travel.

When changing ratios, the toggle switch is moved to the selected range and the actual change is effected when the gear lever is passed through the neutral position. The standard gear ratios are closely and evenly spaced, providing traction and speed over the whole gear range. A variety of pto shafts can be fitted to the gearbox and a filter unit is fitted for cleaning the gearbox oil. The filter is easily serviced from outside the truck.

The clutch on the FB 86 is a dry plate type with hydraulic operation and spring assistance to lower pedal pressure. This model also carries a single reduction final drive for applications of up to 32 tons, but the double reduction is recommended for work up to 48 tons.

In both systems the crown wheel and pinion are of the hypoid type — they have helical gear teeth. The single reduction unit has a 16.5 in. diameter crown wheel and the double unit has a 13 in. diameter crown wheel. On both reduction units, the pinion is located in three bearings and several ratios are offered to make the truck suitable for different applications.

The rear axle is fitted with a compressed air differential lock which can be engaged or disengaged while the truck is running, by using a toggle switch on the dashboard. A warning light tells the driver when the diff lock is in use.

Volvo trucks are fitted with air brakes and the system uses separate circuits for driving wheels and front wheels.

(Continued on page 78)



REVIEWS MACHINES

By J. HARRISON-SMITH



A conical design incorporating three adjustable height nozzles and a folding handle.

A still more complex design with four nozzles. Don't forget to use protective clothing when spraying.



GIVING TREES A FLYING START

Our New Zealand inventor-contributor comes up with yet another home made gadget. This time, it is one to help establish trees in dense grass growth.

IN NZ, an ever increasing area of farm land is being planted with trees, mainly as an anti-erosion measure, and this has brought with it a new problem not encountered in any great magnitude in former days when most planting was done on land covered with native scrub and fern.

Some of this farm land is extremely fertile and as soon as the stock is taken off, the grass grows like wildfire. In a very short time trouble is experienced with it choking out the young trees.

During planting it is usual to skim off a couple of square feet of ground before putting in the tree and this does help a lot, sufficient in fact to allow vigorous trees to get away if the land is not too fertile.

However on really good land the grass still beats the

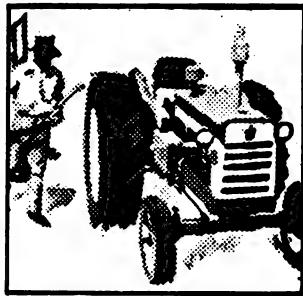
trees and it has been found that it is far cheaper to use chemicals to release the trees from competition than to do further chipping with a spade. Thus the term chemical releasing has arisen.

The chemicals which are most effective against grass will also harm the trees and so, some means has to be adopted to protect them from the spray. A good many means have been tried.

What sort of equipment is used depends in some measure on the size of the job and if only a few acres have to be treated the best way is to make a simple cone of sheet metal which is placed over the tree while the grass around it is sprayed with an ordinary knapsack spray outfit.

When the job is larger — and some programs call for thousands of acres a year — something quicker is necessary and several devices with built in spray nozzles have been produced. Assuredly more will appear, for the problem is a big one and will get bigger still as the planting of former grass-lands gains impetus.

One of the simplest and easiest to make is a shield devised by the writer and shown on these pages. It is merely half a cylinder of sheet iron to which a handle and two boom spray fittings on outriggers are attached and a knapsack added. It is placed against the tree and one squirt with the hand pump is given, then the shield is reversed and another stroke of the pump completes the job. It is quite fast and I have done 17 trees a minute with it in short grass.



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LUXURY ON 10 WHEELS

(Continued from page 76)

On the FB 86, a dual circuit system operates the drive wheels and the front and trailing wheels as well as providing a brake system for trailers.

Other brakes provided include a parking brake to operate on the driving wheels and an engine exhaust brake and a separate trailer brake.

The total braking area is about 1039 sq in., and the air compressor supplying the power for the brakes is gear driven for extra safety.

Volvo has incorporated the forward control, tilting cab configuration, which gives good access to all parts of the engine and transmission.

The chassis is strongly constructed but still allows a certain amount of flexibility. The cross members are riveted to the main frame webs,

which are constructed from heavy U section steel. An extra large U section member is incorporated in the design of the chassis, above the bogie section where the loading is the greatest.

The rear springs of the FB 86 are leaf type, anchored beyond the driving axle. The trailing axle is coupled to the driving axle by means of a balance arm which increases the pressure on the driving wheels by transferring weight, when starting.

Front suspension on the Volvos incorporates double acting telescopic shock absorbers. The electrical system is 24 volt and heavy duty alternator supplies the lighting and ancillary current.

Information supplied by Swedish Motors, North Wollongong, NSW. □

GIVES TREES A FLYING START

(Continued from page 77)

Anyone with tinsnips and a drill can make one in half an hour and all you need is some sheet iron, some aluminium strip for the handles and outriggers and a couple of boom spray fittings. It is perfectly adequate for small jobs and costs only \$3-\$4. Any sort of a back-pack tank can be used to carry the chemical.

When larger areas have to be dealt with more elaborate devices are employed and one of these, also made by the writer, is shown. As will be seen, this is a cone with attached spray nozzles, three this time, mounted on reversible outriggers so that reach

and angle can be altered.

In both of these, a separate pump is employed as shown in the photo, the pump delivering 15 cc per stroke.

A still more complicated cone is also shown. In this case the cone being inverted with four spray nozzles set around the rim. It has a built-in pump operated by a lever. Chemical is still carried in a back-pack tank.

There are several chemicals which can be employed, these being any of the grass killers. Some, based on the chemical paraquat, have an almost immediate effect and the results can be seen in a day or two. □

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IRRIGATION FOR THE MINI FARM



Goldie holds one of the spray valves which is fitted to a $\frac{1}{2}$ in. hose. Hose size is important when ordering.

An answer to the problem of irrigating small areas without having to lay out large amounts of money for plant that is too big for the purpose anyway.

WHEN Ron Goldie originally thought of the idea of this mini irrigation system, he was growing strawberries in an outer suburb of Melbourne. His basic objective was to provide conventional type irrigation without the capital cost and complications of large plants.

"It's no use sending a boy to do a man's job and vice versa," says Goldie. "This applies to irrigation too."

With the Goldie system of irrigation, water can be delivered to the plants with a minimum of expensive equipment. In essence, the system comprises a number of sprays fixed into a garden hose.

The hose is drilled with a $\frac{5}{16}$ in. drill and a tapered nylon insert is pushed in. This is held in the hose with a galvanised clip. This clip also forms the stand which is driven into the ground to hold the sprinkler at the correct angle to give even distribution of water.

The actual spray pattern control is — simplicity itself.

The nylon insert is tapped to take a hollow brass screw with knurled head. There are three types of screws to provide for trickle, or spray

patterns of from 2 ft to 10 ft diameter. The patterns are determined by screwing the screw further into the insert.

A very flat, circular pattern can be obtained with large droplet size by placing a $\frac{3}{16}$ in. brass washer under the head of the screw. This is particularly good for applications requiring a lot of water in a limited area with a minimum of evaporation problems.

The sprays are made to suit $\frac{1}{2}$ in., $\frac{3}{4}$ in. or 1 in. hose or polythene pipe or, a mixture of the three. They can also be set up for siphon irrigating on the trickle principle for strawberries covered with plastic mulch. On this type of application it is necessary to have a filter in the line. Goldie has designed a special filter for this purpose which is easy to back flush for cleaning, without having to remove the gauze elements.

In an evaluation experiment, Goldie had 20 valves on a 1 in. plastic hose. With all operating, the delivery was 52 oz of water, with 10 of them closed off, the delivery only rose to 56 oz.

The valves are usually supplied in lots of 10. □

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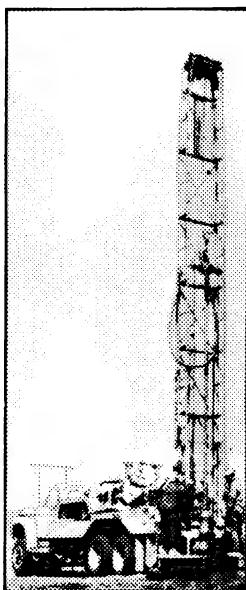


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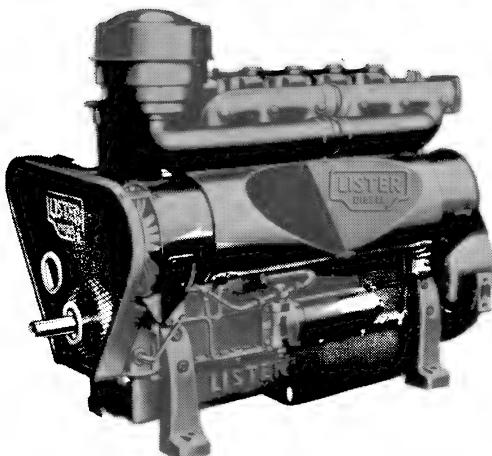
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The Hereford steers used in the New England experiment put on an average 1 lb a day during the experiment, but less than a 0.5 lb a day in winter months.

These Brahmins averaged 0.91 lb a day during the experiment, and in winter the growth rate remained comparatively high at 0.68 lb per day weight gain.



BRAHMANS PROVED IN COLD CLIMATES

Mention Brahmins and most graziers think of the tropics, but studies in the NSW New England show the breed has much to offer in cold climates.

ALTHOUGH Brahmins have proven themselves an asset to the cattle producer in northern Australia, little attention has been placed on their potential in the temperate regions.

Work in Canada has shown first and second cross Brahmins to have greater preweaning and postweaning liveweight gains, and lower winter weight losses, than purebred Herefords run under conditions far more extreme than those encountered in any southern Australian cattle region. Monthly temperatures ranged from 10 degrees F in winter to 68 degrees F in summer, with five months each year below freezing.

Ten-year-old first cross Brahman cows weighed 125

lb more than and weaned calves averaging 110 lb heavier than those from similar aged purebred Hereford cows.

Besides the Brahman's superior ability to use low quality roughage and inherently greater milk production, these results can be attributed mainly to the high degree of hybrid vigor resulting from a Brahman-British breed mating; this is even apparent in the $\frac{1}{4}$ Brahman (see COUNTRY, Sept 1968, page 18.)

LEAN MEAT

A further attribute of the Brahman that can be obtained in any environment is the greater production of lean meat on the carcass.

However the breed tends to be discriminated against on the grounds that its sloping — goose — rump and irregular conformation are thought to be associated with a lower yield of high priced cuts on the carcass.

In the light of these conflicting results on the usefulness of Brahman blood for

improving returns from southern beef producers, the following study was initiated.

Four purebred Hereford and four second cross Brahman steers were run together on improved pasture in the New England in Northern NSW over a 12 month period.

During this time they were weighed every three to four weeks and at the finish of the trial they were slaughtered — at the same body weight — and certain of their carcase characteristics were compared.

The average daily gain during the year was 1.00 lb per day for the Herefords and 0.91 lb per day for the Brahmins.

However, over the three months of autumn, when pasture availability was very low, the Brahmins gained 0.68 lb per day as against the Herefords' 0.45 lb per day.

SPRING FLUSH

Pasture renovation in early winter reduced this breed difference and the spring flush of pasture growth reversed it to 1.69 lb per day for the Herefords and 1.47 lb per day for the Brahmins for that season.

Therefore, even though

autumn temperatures were very low by Brahman standards — the May monthly minimum was 40 degrees F — they still showed a 34 percent advantage in live-weight gain as a result of their better ability to harvest and use the sparse pasture.

After slaughter and dissection of the carcases into retail commercial joints, there was no breed difference found in the yield of expensive cuts, thus disproving the widely held view mentioned earlier.

RIB EYE

However, the Brahman carcases had a 20 percent larger rib eye muscle area and a 36 percent lower thickness of fat over the rib eye. Both these characters are used by research workers in assessing carcase quality.

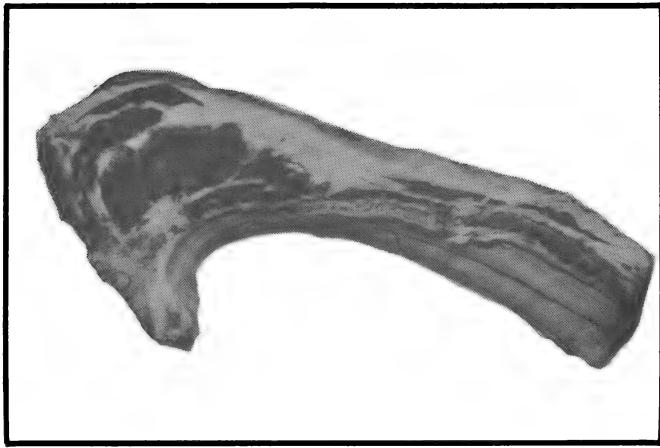
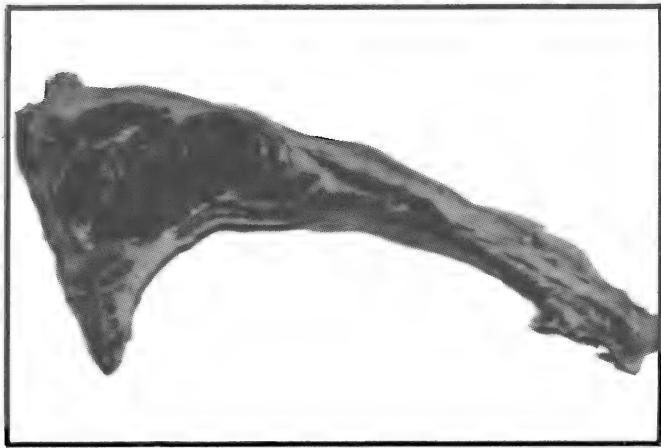
Carcase composition also favored the Brahmins as they had a higher lean meat content: 64 percent as against 59 percent, and a lower fat content: 20 percent as against 25 percent.

Therefore in the final evaluation of the breeds, the Brahmins yielded 57.2c per lb and Herefords 53.1c per lb of fat trimmed saleable carcase.

The results from New

By J. B. MORAN

The author is now an officer with the Primary Industries Branch of the Northern Territory Administration, working with the CSIRO animal genetics division at Rockhampton, in Queensland.



England and Canada show the tremendous potentiality of Brahman type cattle for improving beef cattle productivity in temperate climates — particularly on native pastures that drop in quality until they become standing hay during the drier parts of the year.

Their lower requirements for protein and for water would also prove an asset during these months. There have been reports that Brahman cross cattle appear less susceptible to bloat than British breeds when fattened on lucerne or other bloat-inducing legumes. Critical research has not yet been conducted on this subject.

Constructive breeding is necessary to make full use of the hybrid vigor and other advantages of the Brahman breeding.

For example, one could follow up a Brahman-Santa Gertrudis mating program and select for performance among the second and third generations: the (3/4 and 7/8 Santa Gertrudis). In this way it is possible to retain the genetic diversity of the Brahman and the growth rate characteristics of the Santa Gertrudis.

By conducting this program in temperate regions one could also develop a strain of cattle with a reasonable degree of cold tolerance.

The result of a mating between such an animal and a productive British breed would be one that would produce at a high level in

The much lighter fat cover and far larger rib eye of the Brahman is shown graphically in these two photos from the Moran test.

districts of low temperature and low pasture quality during the year.

The results reported in this article were obtained while the author was working in the department of livestock husbandry at the University of New England, Armidale. The work was made possible by grants from the Australian Meat Research Committee. □

THOSE BOOMING BRAHMANS

In the past 12 months no cattle bred in Australia has boomed to such an extent as the Brahmans. According to a report by the president of the Australian Brahman Breeders' Association, Charles Young, branches of the association have been formed in the past 12 months in the NT, southern Queensland, Victoria, NSW and WA, while moves are afoot to establish a branch in SA.

The number of registrations doubled between September 1968 and September 1969. More than 10,000 purebred and appendix cattle are now on the association's books.

Of significance, and tying in with the report on these pages by Moran, is the growth of membership outside the traditional northern areas. Not only were the Victorian and NSW branches formed, but the number of studs rose to 88 in NSW and 18 in Victoria.

The incredible sale of Waverley Noel de Manso for \$56,000 in November capped a tremendous year for the breed.—GM.



Moran's trials showed that the "unattractive" gose rump of the Brahman did not affect the production of saleable meat.



Mr Tassoni at work in his orchard

zetor tractor 'leaves them all for dead'

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Mr. Bill Tassoni, an orchardist in the Goulburn Valley, Victoria, uses a Zetor to pull a 500-gallon spray (weighing five tons) in wet weather. He tried three other tractors, including a crawler, but all bogged in the heavy going. He traded a crawler for a 4 x 4 Zetor, and now works in all weathers. "Zetor leaves them all for dead," says Mr. Tassoni. Mr. Tassoni said that even if the 5545 did no more than pull his spray in the wet it would justify its existence. But it does other things as well — like pulling an offset plough under trees without the help of a turning brake to keep it straight. (Other tractors wore out their brake linings doing this.)

Here are some other Zetor success stories:

Mr. Frank Kastanek is a well-known Breeder and Exporter who has 1000 acres in the mountains at Narbethong, Victoria, where he runs an Aberdeen Angus stud. Ten years ago, the whole of the property was covered with timber. Mr. Kastanek and his workers set out to clear it. Trees were brought down with a bulldozer. Then a 60 h.p. Zetor four-wheel-drive tractor (the 5545) went in with a giant scrub rake to gather up the rubbish left by the clearing operation.

"No other four-wheel-drive tractor could even climb these hills with this machine behind it."

Mr Kastanek at the wheel of his Zetor 5545



Saved golf course.

Another four-wheel-drive Zetor, fitted with special diamond tread rear tyres, solved a problem that was threatening the surface of a golf course at Chirnside Park Estate, near Lilydale, Victoria, a residential project being developed by Willmore and Randell. The weight and wheel spin of a standard type tractor cut up the grass on the fairways of this hilly course. Zetor's traction solved this problem, too.

Cuts down ploughing.

The potato-growing firm of Trainon and Sapemas, at Lyonville, Victoria, cut out one run with its plough and still got fine, deep ploughing with Zetor four-wheel-drive. George Trainon thought Zetor 4 x 4 gave him the equivalent of an extra 15 h.p. Zetor was light, he said, but "had the traction." See Zetor in action on your property. Ring your Zetor dealer now. Models from \$1998.

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By JOHN MONK

JANUARY is a very good snipe month. The birds are widely distributed in Australia, and may be found in most marshy areas that are their normal feeding grounds.

Snipe usually arrive in Australia during the early days of spring. This is taken as September, but the birds are liable to arrive in August — sometimes even before this depending on the seasons. Seasons affect snipe very critically. To survive, they must escape from the cold and wintry weather.

They are equipped only to feed in circumstances favored by warmer weather. Frozen ground and particularly cold conditions are completely unsuitable to

them. For this reason when winter strikes they must be elsewhere.

Snipe have long, soft and flexible bills that are adapted for probing in the soft mud and sand in search of their food, which consists of all the small creatures and insects that frequent the mud of swamps, estuaries, mud-banks and sandbars.

From Australia, snipe migrate to Japan — though why they should migrate over such a long distance is something of a mystery to me. They could find the conditions they seek in northern Australia. They nest on the slopes of Mount Fujiyama, in Japan, and return here for our spring.

Jack-snipe is the only bird

of the species which may be hunted in Australia. The native snipe — the painted snipe — is wholly protected.

There is no bag limit on the Jack-snipe, though there is a closed season in Victoria, during the month of June, but why this should be nobody appears to know. This season was apparently on the books when the present Fisheries and Wildlife Department took office, and it was left that way. As there are no Jack-snipe in Australia during June, it makes little difference.

Anyone who likes hunting duck on swamps, marshes and marsh lined rivers and creeks, usually like snipe hunting, for it is very much the same type of hunting as walking-up ducks.

The best gun for snipe is either a very light 12 bore, or, even better in my opinion, a good 20 bore. A heavy, ponderous gun is almost useless for snipe.

A light gun will point and swing much easier and faster than a heavy one, and for snipe there is no doubt that the light gun is ideal, for light loads are generally

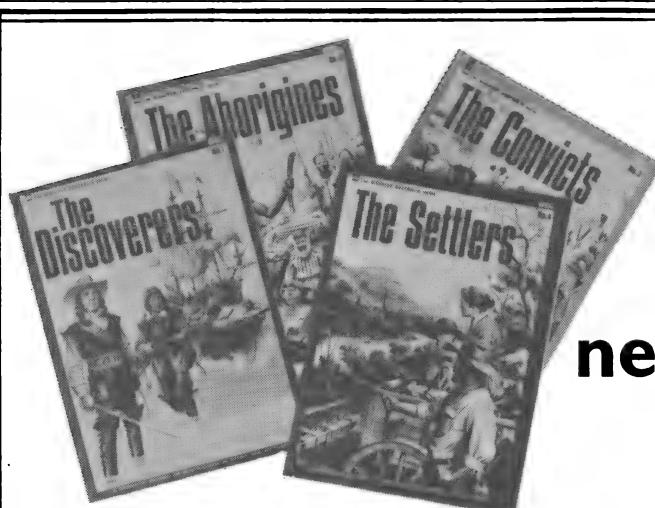
used. My favorite gun for snipe shooting is a 20 gauge double barrel, bored improved cylinder and modified.

It is not easy to shoot a full bag of snipe. And this is one of the reasons why snipe shooting is such sport.

I have found the best shot to use for snipe is Number 8. When using 12 gauge guns, cartridges do not need to be heavier than $2\frac{1}{2}$ to 2-5/8th in length. And shot loads need not be heavier than 1-1/16th of 1 1/8 oz of shot in 12 gauge.

When using 20 gauge guns, shot-weights should be between 1 oz and 1 1/8 oz. For full versatility, 20 gauge guns are best chambered for 3 in. cartridges, and if long forcing cones in the barrels are ordered, the gun may be used for a very wide range of shooting. Such a gun can be used on duck, snipe, quail, rabbits and hares with deadly effect, combined with beautifully smooth handling.

Snipe shooting can be excellent sport, wonderful practice; and usually once started, a shotgunner remains an addict for life. □



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HOW TO BEAT TRACTOR NOISE

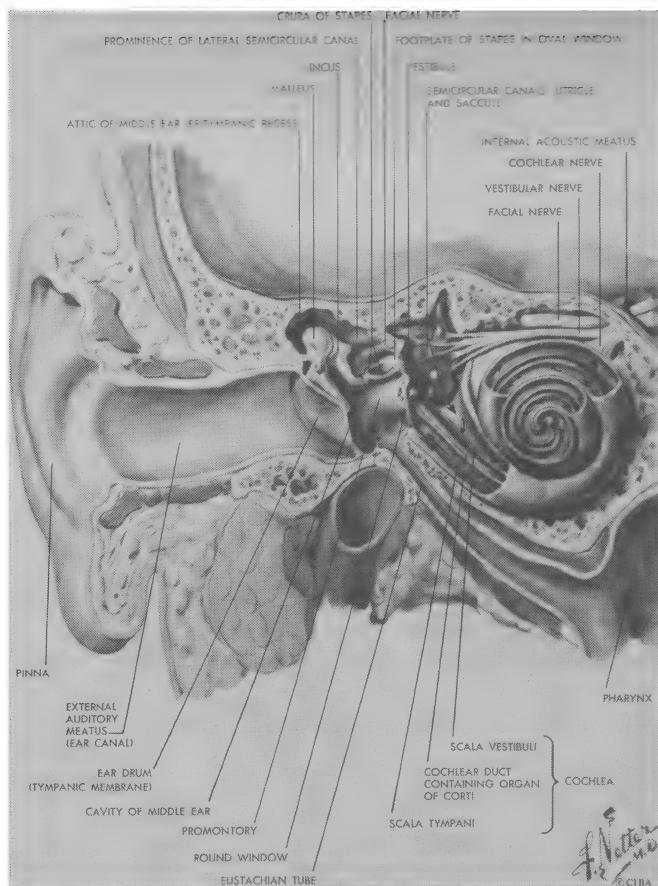
Are tractors or power saws sending you deaf? If they are it is your own fault for not taking proper care, according to this special report for COUNTRY by a Macquarie St Ear Specialist.

HEARING is one of those wonderful faculties of the human body which is taken for granted. It is only those who, having lost part or all of their hearing, can fully realise what this affliction means.

Some appreciation of these difficulties and hardships becomes apparent to those of us whose work brings us into daily contact with this group of people.

However, to the world at

This diagram of the human ear shows the pathway of sound as it travels to the brain.



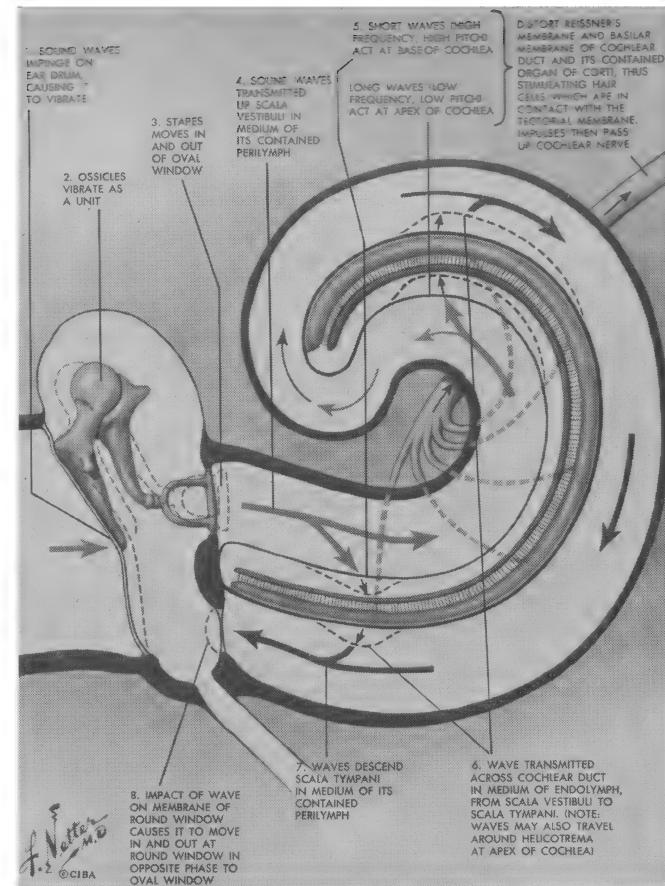
The problems are not all one sided either.

It is often found that the person hard of hearing is the last to realise, or willing to recognise, that he has a problem. This often leads to tensions within the home when it becomes necessary to repeat everything being said, or to have the volume control of the radio or television turned up to what is an uncomfortable level for the rest of the family.

Why be a party to the cause of this unhappy set of circumstances? Why help this affliction? Especially when in most instances it can be prevented.

I am referring to noise induced hearing loss.

The transmission of vibrations from the ear drum to the cochlea are shown in this sketch.



In the October 1968 issue of COUNTRY appeared an article which related to tractor noise. It gave the overall picture of what can and does happen to the man who spends long hours in close proximity with these mechanical monsters.

I fully support the facts as presented in this article and add my plea for a saner and more sensible approach to the problem.

But, besides tractor noise, I should point out that there are other hazards which the man on the land has to face from time to time. Chain saws and timber saws can rival tractor noise in intensity. A 12 gauge shotgun produces a very high noise rating which means that some people, even while at leisure — for example, clay pigeon shooting — leave themselves open to a major hazard unless proper and adequate protective measures are taken.

It is obvious that to reduce the amount of noise produced is not always easy because it would lower the efficiency of the machine. However, it is only stubbornness which stops the opera-

tor from using the excellent and efficient means available to him to prevent this unnecessary damage to the ears.

Various types of ear plugs, protectors and muffs can be worn under all circumstances with no reduction to the efficiency of the wearer.

I must admit I become frustrated and, indeed, more than somewhat angry when I see patients who have been warned of their hearing loss — and advised of the protective measures available — to then have them front up before me later with an increase in their loss because they had taken no proper steps to stop the damage.

If you look at the two diagrams on page 85 you will find they are fairly self explanatory.

Noise — defined as "unwanted sound" — is the result of vibrations of high intensity in the air. Most noises are a mixture of sounds of varying frequencies. That is, the noise is rarely just one pitch but, rather a mixture of a number of frequencies or pitches.

Basically, as mentioned in the other COUNTRY report, a noise over 90 decibels can be damaging if the ear is exposed for a sufficient length of time and — when the loss of hearing in this critical range of "speech frequencies" become great enough — the person will come to realise that they are having some degree of problem with their hearing.

This may only mean missing the odd word or two at the beginning which can lead to difficulty in surrounding noise to understand the full meaning of conversation. Later the difficulties increase as the loss becomes greater.

We hear because the vibrations of sound in the air set the eardrum into vibration. These vibrations are transmitted through the middle ear cavity via three small bones which form a lever system.

The first of these bones is attached to the eardrum and, called the stapes or, stirrup — because its shape is quite the same as the stirrup on a saddle — fits into an oval

opening in the wall of the inner ear.

When the vibrations reach this point they are transmitted to the fluid which is contained in the inner ear. This fluid then carries the vibrations to the very specialised tissue in the inner ear, in the structure called the cochlea and especially to that part called the organ of Corti, which can be seen in the diagrams.

Depending on the frequency or pitch of the note being transmitted, so the appropriate part of the membrane in the organ of Corti is stimulated thereby setting up a nerve impulse which passes via the nerve of hearing, to that part of the brain which is associated with hearing.

When the degree of loudness of the noise is so great that even the sound dampening and shock absorbing mechanism in the middle ear cannot sufficiently reduce its degree, the very sensitive tissue in the organ of Corti, in the inner ear, takes this extra force and there is a shearing effect which causes damage.

This damage cannot be repaired.

So, I would appeal to all who must of necessity expose themselves to noise which is dangerous to the ears, to take the simple precautions.

I am sometimes asked how loud has the noise to be to be dangerous. I reply that if in doubt assume that it is dangerous.

Certainly if, after exposure, the ears ring or have a feeling of fullness or, if there is obviously some loss of hearing after exposure, even if these things are temporary, then the noise is hazardous and needs to be guarded against if you are to save yourself from an unnecessary extra burden in this day and age when so many other things exist to cause us difficulties.

The answer to this problem is squarely in your court. *Footnote:* The illustrations of the human ear appearing on these pages are Copyright "Clinical Symposia" by Frank H. Netter MD, published by CIBA Pharmaceutical Co. □

SPEND MONEY TO MAKE MONEY

(Continued from page 39)

All lenders test the borrower's ability to repay.

All borrowers should test their ability to repay and be prepared to demonstrate this to credit sources.

A properly and thoughtfully documented request should accompany all institutional approaches. If time or skill for this job is lacking, then hire someone competent. It may be that in the course of the exercise important errors are disclosed.

Credit sources are critical of badly presented requests for finance and not infrequently, an unwarranted refusal to lend results from incomplete and poorly documented requests.

If the flow of business income is variable, unwanted taxable surpluses occur. Plan part of the next year's development program so that it can be easily brought forward to the current year. This avoids the last minute rush to spend recklessly on plant and other items of doubtful value.

The budgeting required to use available funds to best

advantage is detailed and difficult — but essential for success.

In a tightly budgeted situation, expansion of a program and additional borrowings must be planned carefully. The additional borrowings will require servicing so the program should be able to produce income sufficient for this purpose.

Lenders to the rural community know that droughts, floods and other disasters are a problem. Most lenders will approach the measurement of prospects with good and bad years in mind.

This is not ultra-conservative, nor a prediction of a drought occurrence — but some attempt is made to keep the prospect of these hazards in mind when forecasting an average performance.

In times of stress, two actions of financial importance usually occur — credit facilities are made available for carry on purposes through State Banks. Most lenders don't expect loan reductions from genuinely affected victims till the crisis passes.

Many experienced and successful farmers use Rural Advisors. Their own skills and knowledge become fully extended and the outsider is called in for consultation.

It is frequently incredible to see the lift in income that results from critical analysis.

Farm programs can be developed, tested and improved with the aid of computers. This is relatively inexpensive. Universities supply computer services to farm consultants who collect the data and interpret the result.

Computers can select the optimum farm enterprise from a vast array of possibilities and select the optimum management method where alternatives are so great that manual methods are too laborious. (See COUNTRY December 1969, page 12.)

The effect of a number of forecast circumstances on a management plan allows measurement of risk. The use of computers with farm management is an exciting development.

At the outset there may be no practical benefit to be had from the computer be-

cause experience, planning and pen and paper analysis will be more than adequate for dramatic improvement. It is when farm efficiency is at a high point that computers are of special benefit.

In summary, an approach to land purchase and managing the rural enterprise is tabulated:

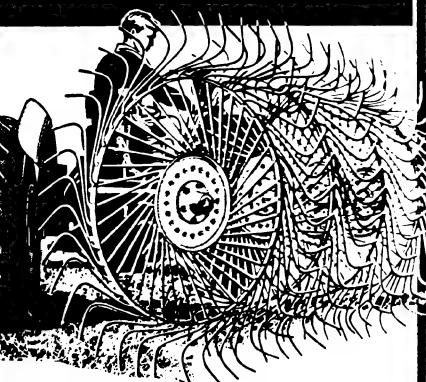
- Decide that a rural enterprise is desirable.
- Determine the type of farm required.
- Invest as an individual or seek out an investment group.
- Expert advice on land purchase matters is available.
- Make the development suit the individual financial requirements.
- Plan an appropriate corporate structure.
- Know rural credit and sources.
- Plan borrowings carefully.
- Research and Development Program.
- Prepare detailed farm budgets.
- Watch profits.
- Keep computers in mind.
- When in doubt, buy expert knowledge. □

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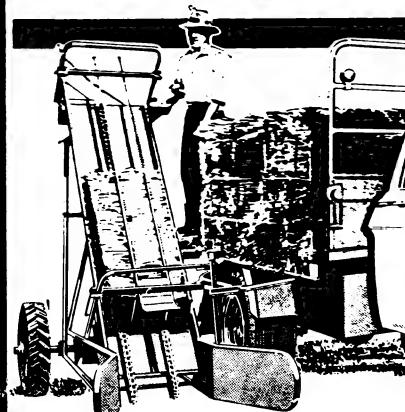
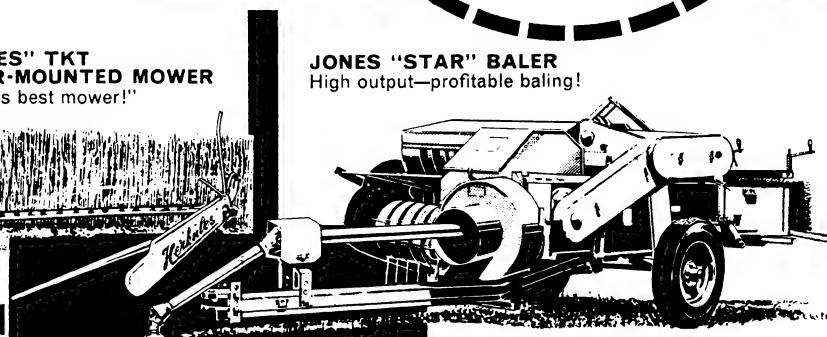
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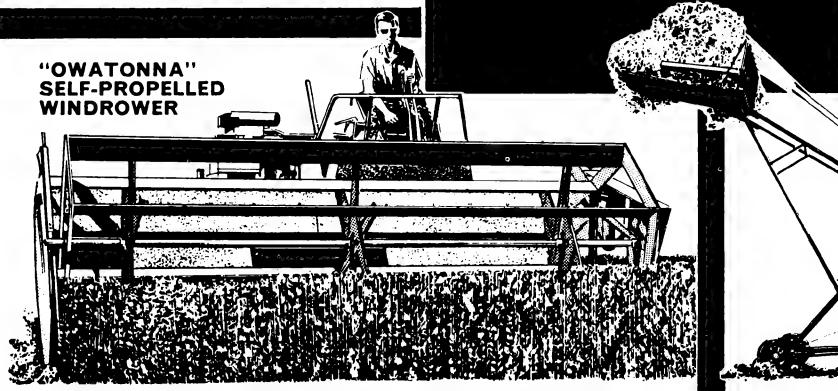
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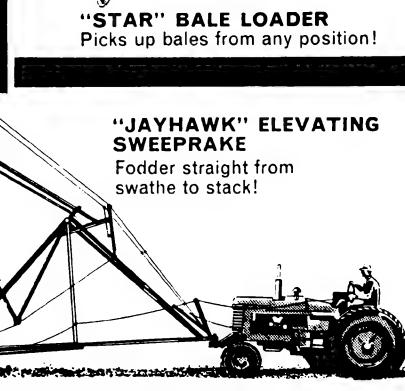
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SOIL EROSION IS A FARM COST

By I. R. CARTER

The basic asset of the farm — the soil — should be treated like any other item of farm investment, but it so seldom receives the care it requires.

OUTLAY versus probable or possible returns: this is the way farmers today assess new projects, diversification, or a major switch-over.

While mortgage or leasehold agreements usually include carefully-drawn provisions for the maintenance of buildings, fences, and other improvements, it is the exception to find in them specific provision for maintenance of the farm's major asset: the soil itself.

This attitude may stem from the old feeling that here was land, millions of acres of it, to be used and exploited to its full capacity for ever and ever.

The heirs to that attitude are now paying the price, and it is not only increased municipal rates for drainage and erosion control along the roadsides. Many of them now face the fact that unless costly measures are taken in hand very soon the creeping erosion that "didn't look really so bad a few years ago" is about to cut the property in half and that the carrying capacity is steadily going down.

Land prices are now so high that few landholders can afford, or are silly enough, to maintain the laissez faire attitude of "she'll see me out" as their farm steadily washes itself away along the eroded gullies that grow deeper, wider and longer every time there is a substantial downpour.

But what are the hard facts behind erosion control? How much, or how little, should the landholder undertake?

What are the costs? What can the owner expect to get

back in cash or increased land value?

Is it going to be worth while to go the whole hog on erosion control, or will it be near enough to take palliative measures on some of the worst spots?

Statutory erosion control bodies vary in their scope and role from State to State.

Take Victoria's Soil Conservation Authority which is reasonably typical. Last year the SCA inspected more than a thousand properties at the invitation of the owners. Landholders here are generally so conservation-minded that the authority is embarrassed by the number of requests for advice and control work.

In the top priority field—group conservation—landholders must now wait for years for the authority to deal with their requests to form group conservation areas. Nearly 900 farmers and graziers are involved with the SCA in group and catchment plans in more than 60 schemes totalling more than 416,000 acres.

What then are the economics of erosion control, consolidation and recuperation? Surprisingly low, if the work can be done by farm

labor and equipment and allowing for Government grants.

Specifically, the Victorian authority grants on a 1-to-4 basis to individuals for capital works: if a job costs \$500 the SCA pays \$100 and the landholder \$400.

In group projects, the SCA finances all the non-productive work on condition group members carry out planned productive works. Non-productive work includes reducing run-off, clearing stumps and rabbits, improving or re-siting fences. Productive works include better pastures and improved water supplies from dammed-up gullies.

The SCA says the average overall cost per acre is \$10 for productive work and \$4 for non-productive.

In the Mallee, the authority gives free cereal rye seed and fertiliser to stabilise drifting sands, gets back 40 percent of the resulting crop.

There is an engineering fee of \$20 for farm water supply plans, \$32 a day for an engineer to supervise construction, or \$24 a day for an engineering assistant.

"The farmer must weigh the cost against what he is going to get out of it," says the SCA. "If he can lift the carrying capacity of one dry sheep to three dry sheep an acre he can afford to spend \$8 an acre for the increase of two dry sheep an acre. Land values, as a by-product,

go up three or four times."

Sometimes there are no "ifs and buts" about undertaking erosion control. Such was the case with Geoff Henderson, of Inverness, a 308 acre grazing and mixed farm overlooking Swan Bay on the Bellarine Peninsula, a few miles east of Geelong, Victoria — 22 in. rainfall country.

He is now nearing the end of a 17-year battle to overcome severe erosion on the sandy clay loam overlaying friable orange-brown clay.

When purchased in 1951 the grazing block was in a semi-natural state, without buildings. Fallen timber and rabbits abounded, boundary fences were poor.

Inverness was considered to be capable of running 0.75 dry sheep to the acre. But even at this modest stocking rate the sheep lost so much condition in three months they had to be taken off.

But the main problem was the torrential run-off from 4500 acres of catchment on higher ground on neighboring properties.

The effect of the run-off on the weakly constructed soil was to cause severe, multi-headed gully erosion along two main drainage lines through the property. Now controlled, these gullies are up to 15 ft deep and about a chain wide. They had extended almost half-way across Henderson's property when he bought it. If left unchecked they would have cut Inverness into three sections.

At some time in the past a council road easement had been cut through the bottom end. Storm water had quickly gullied the road drains to a depth of about 12 ft.



The eroding stream floor, downstream from the gully dam, is now well protected by pasture. Henderson will build additional dams for irrigating Inverness.

While still working for their father, Henderson and his brother spent four years clearing and cropping. Then they went it alone, built subdivision fences, and abandoned cropping for wool and fat lambs, and latterly vealers and early potatoes under spray irrigation from the bountiful water impounded in the once-useless gullies.

Before tackling the major erosion heads, Henderson built four small farm dams in minor lateral gully heads. All work was carried out under the design and guidance of the SCA.

Then the major job, on the first drainage line. Small levee banks were built to stop run-off spreading over the property, and to direct them instead towards the main gullies.

Here, water is collected by two large diversion banks and channelled into a concrete chute, 20 ft wide at the notch, that takes water into the gully floor 15 ft below.

Henderson built this massive structure with only one man's help. Preparing the site in two weeks, and another two weeks to concrete, using 160 bags of cement. Apart from some minor undercutting and seepage, the chute has functioned well.

In the same gully two large earth gully-block dams are filled by run-off water via controlled pipe outlets through the diversion banks.

The lower gullied portion has been controlled by a different method. Water impounded by a large earth gully dam floods the main gully head. The overflow is run along a grassed waterway and trainer bank, discharging down a grassed chute back into the gully.

floor lower down the slope.

This earth dam cost Henderson about \$600 to build three years ago. It impounds 20 ac ft in the eroded gully for a distance of 1300 ft. One 10 ac ft dam cost \$300. The other smaller dams cost "next to nothing".

All told, he now has 30 ac ft of water at his disposal, plus control of erosion, at a very modest total cost of \$1600. The SCA provided the 160 bags of cement and 12 sheets of reinforcement. And 30 ac ft of water, in a 22 in. rainfall climate, is really something worth having.

Henderson spray irrigates potatoes for the winter market. The area is practically frost-free and potatoes grow there almost throughout the year.

Major works in the intervening years include dividing the property into 16 paddocks, and providing seven stock water dams. From an uneconomic 0.75 dry sheep to the acre, he has upped the stocking rate to five dry sheep equivalents, sowing down perennial rye, sub-clover, and some phalaris.

He runs Merino-Border Leicester first cross ewes, and Corriedale ewes mated to Dorset Horns and Poll Dorsets for fat lambs. Last year they produced 640 lambs.

Henderson won the Otway District SCA competition for soil conservation in 1968, and holds the coveted Hanslow Cup. Hard work and a modest outlay have transformed a badly eroded property into a thriving proposition.

In this case it was not "Will I?" but "it's got to be done" to stop a potentially fertile property going down hill. □



A pump lifts water from the dam in the gullies to irrigate early potatoes for the Victorian market. The area is practically frost-free and the crop can grow practically all year round. TOP.

Inverness produced 640 lambs last year from Corriedales and Merino cross Border Leicester ewes mated to Dorset rams. The farm is only small—308 acres near Geelong, Victoria.

This massive concrete chute took 160 bags of cement to build. It takes runoff water from low hills, which is channelled in by two large diversion banks. LEFT.



THUMBS DOWN ON HOT

There are more than just a few reasons why country homesteads should be airconditioned — there're hundreds of reasons — and all of them valid, too.

By SONYA BEGG

WHEN I first started gathering information for this feature, every manufacturer I approached gave me the same message to pass on to COUNTRY readers. And this was — "airconditioners not only cool air, they also heat it."

Most of us these days associate airconditioners with stinking hot days instead of including freezing cold nights as well.

So—lesson number one—airconditioners are for summer and winter.

I was quite surprised to find that most of the people I spoke to concerning country airconditioning recommended individual room units instead of the "whole house" type.

Their reasons being that the whole house type units are far more expensive than the ordinary one room type,

they are difficult to instal and maintain and have to be handled by experts trained for this very purpose. Ceilings usually have to be fully insulated to get the most out of these units — and there is another added expense. The lack of servicing facilities, nearby, seems to be the major country drawback however.

On the other hand, the individual room conditioners are relatively easy to instal and maintain.

Two men who are reasonably handy with their hands, could instal one of these units in a short time. They are usually placed in the lower half of a window

frame and held in place with the aid of metal brackets. Their outside appearance is not attractive — but not objectionable and inside, the facia is quite tastefully designed on all makes and models.

The installation is simple except for lifting the units and this is why two men are recommended.

It is no longer necessary to hook up a room conditioner to the plumbing. This type of unit went out a long time ago. These days, they

Carrier Quietline — an air-conditioning unit which lends itself to enhancing the decor of any room in the house.



SUMMERS...AND COLD WINTERS

work on a similar principle to a refrigerator — they are simply plugged into a 240 volt power source.

Unfortunately, no manufacturer I know puts out a unit suitable for 32 volt supplies.

The fan in the conditioner blows air across a "grid" or series of pipes carrying the refrigerant. When the operator dials for cool air, the fan blows air over the cold pipes and as cold air sinks and flows out across the floor it sets in motion a convection type flow.

The air supply can either be recirculated, brought in from the outside, or exhausted from the room by simply turning a dial, allowing complete control over the type and the warmth of the air.

Most of the room units on the market today are fitted with thermostats which work automatically to keep the air temperature constant at all times. The general opinion seems to be that the individual room type conditioners of about 1.75 horsepower are capable of raising or lowering the temperature about 15 degrees inside the homestead.

Most are also fitted with humidifiers which extract excess humidity from the incoming air. They do not however, extract too much humidity making it unpleasant to breathe conditioned air.

Servicing the individual room conditioners is a simple matter of cleaning the filter element. The job is as simple as, and similar to, emptying out the vacuum cleaner bag, but it is a much less dirty job.

Many manufacturers claim that the units can operate continuously for three months at a time before the element needs cleaning but this period depends entirely on the outside dust.

If you are living in the desert, it may be necessary to clean the element every week and on the other hand, if you are living in the tropics, it may not be necessary to change it for a year.

From what I was told, a one horsepower unit seems to be capable of heating and cooling the average sized bedroom and the 1.75 horsepower units are suitable for a combination lounge-dining room. These respectively run out at about \$350 and \$450, I was told.

Running costs of airconditioners vary a fair bit but as a guide, I was told that the 1.75 horsepower unit costs about 1.5c per hour to

operate. If one was operated for a whole year, the cost would be about \$130. In actual fact, this would be the maximum cost. With the doors kept shut and the thermostat operating, the actual cost would be lower than this high figure.

If you take into account the heat you have to put up with during the summer and the nagging you generally have to do to get wood chopped for the fire for winter — AND the cleaning out of the open fireplace —

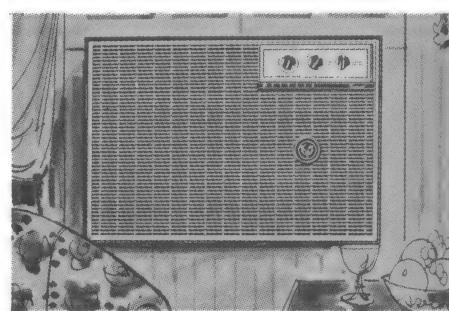
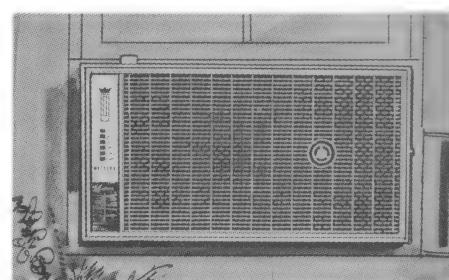
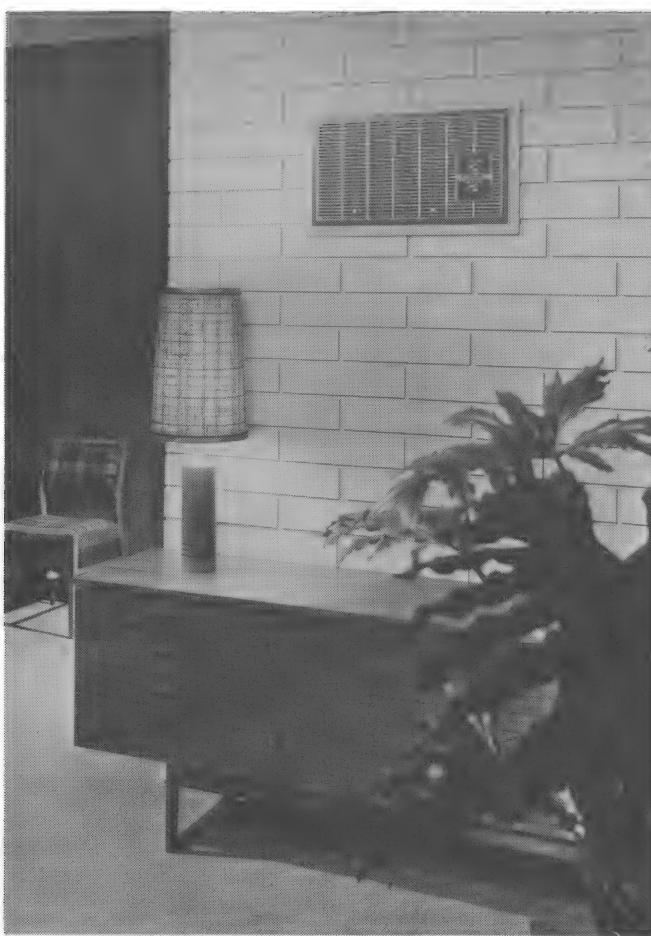
The Bonair model 220 is an unobtrusive conditioner capable of cooling you in summer and warming you all through winter.

airconditioning gives a lot more for its money than just functional heating and cooling.

I am also told by all the experts that airconditioning improves sleeping, giving a much more restful night allowing fast recuperation for our hard working men-folk.

Next time you're in town have a talk to your local electrical appliance man about airconditioning — you'll be doing yourself a favor. □

Three of the Metters units suitable for mounting in the lower half of a window frame in any room of the house or homestead.



PARTY LINE

with Jane Dawson

SPOTLESS KIDS

How I hate them! Who? — I refer to those spotless children who are used to advertise products on television.

Sleek, well groomed and beautifully dressed, they eat their way gaily through all kinds of food from thick soup to multi-colored ice cream.

I'm just waiting for the day when one of the little dears will push the plate away and say "I hate this stuff".

—C.E.L., Swan Reach, Vic.

PENFRIEND WANTED . . .

. . . for 13-year-old girl. Interests — reading, drawing, watching television, school work and cooking. Miss Karen Milton, PO Box 338, Ingham, Queensland, 4850.

SAVING DESERTED LAMBS

Some years ago, a friend of mine gave me an expensive, but overpowering body spray, to be sprayed like a scented mist. I loathed the smell and put the container in the wash-house.

Last winter, a baby lamb was deserted by its mother and my son was determined to save it by putting it on another ewe which had a lamb. So he locked the ewe in a small shed with the two lambs and sprayed them heavily with the reeking perfume.

It worked perfectly — the ewe reared both lambs, and I found some way of getting rid of the perfume.

—Mrs C.E.L., Swan Lake, Vic.

NO MORE WAVING

During my youth, I travelled to the country a great deal. I always got a lift from the friendliness shown by country people, especially those driving along our outback roads.

Last month I had occasion to travel to the country for the first time in some years and was most disappointed to find that the waving custom between cars seems to have come to a complete stop.

—Mrs G.C.I., Lane Cove.

Curiosity would usually cause one listener to answer the door, so the odd one out gained a listen in. Dad got fed up with the knocking, as he was usually the one caught. So he would say, "Come in, the door's open."

One night we were astonished to find a tramp actually come in. He was shown the new wonder wireless, given a meal and a cup of tea, and a bed for the night.

Dad thought it could never happen again — but it did.

A knock at the door — "Come in," said dad, "and have a cup of tea." Another knock! "The door's not locked — open it and come in," insisted dad, and — much to our amazement in came a smartly dressed man and woman.

They told us they had built the house, and had come back to see it, feeling very daring at knocking at the door; but overjoyed to be asked in for tea! They were so glad such friendly people lived in "their" house.

—G.H., North Queensland.

AROUND THE HOMESTEAD

With JOAN MARRIOTT

SOON TOMATOES and passionfruit will be plentiful. Here's a tasty tomato and passionfruit jam to ring a change on your pantry shelves. You'll use 3 lb ripe tomatoes, 3 lb sugar, 6 passionfruit. Peel and slice tomatoes and boil until soft. Add sugar, stir until dissolved and boil mixture hard for 30 minutes. Add passionfruit pulp and boil again for five minutes. Test the jam. Continue to boil until setting point is reached. In place of passionfruit pulp, you can add a tin of raspberry or pineapple jam, or lemon juice and rind or orange juice and rind.

* * *

FIGS, TOO, will be hanging heavy on your trees shortly. Try crystallising the fruit for special occasions. You'll need 6 lb figs, 4 cups water, 6 cups sugar and 3 tablespoons vinegar. Make a syrup with sugar, water and vinegar and when boiling add figs. Boil for 2 hours. Drain and place on a rack in the sun. Turn daily for six days, then dust with castor sugar and store in airtight tins.

* * *

DO YOU HATE to bake a roast because it spatters your oven? Use a shiny, medium weight aluminium lowside baking pan for roasting because the shiny surface reflects the heat and stays cooler, thus preventing the fat from spattering as the meat cooks.

GOSSIPING is inevitable in any small township and over the years, since I first came to live near one, I've grown to accept the very public address systems that activate every little outback community. And there have been times — like you — that I've been hurt by their petty suppositions . . . times I've been amused . . . times my ego has been bolstered by their unabashed exaggerations and, in honesty, will admit there have been times I enjoyed the little snippets that came my way. Why not? After all, we are humans, and most of all, we are women. A friend home from years living midst the sophistication of London and New York refuses to classify it as gossip. Although she was obviously amazed by the "interest" and enthusiasm we all embarked on discussing our friends' latest cars, dresses, electric stoves, lounge suites, domestic helps and the thousand and one other things we country women have in common, she said "I used to think it was gossip. But after living in anonymous situations overseas where no one really cares if you wear mini skirts, get to work on time, bring the milk bottles in, are sick in bed for a week, need help, I've come to call it interest". And in our town, while our gossiping remains vivacious and not vicious I'll be glad it's there. And while they bubble on about Mrs Jones who is sick in bed all week — "poor dear" — they are ensuring there's someone who knows Mrs Jones needs help . . . and that unique brand of generous outback charity.

* * *

NEXT LAMBING when you're struggling to rear those orphan lambs, think about this result of extensive tests in America. The US Department of Agriculture claims ice cold milk is the best thing to feed orphan lambs because the nearly frozen milk does not support bacterial growth. This way, digestive upsets are eliminated. Also, lambs drink the cold milk slowly, so over drinking is not a problem.

EASY WAYS TO PRESERVE FLOWERS

Country women don't get much time to indulge in a hobby, but here is one which is a lot of fun, doesn't take up too much time and has a useful end result for the home decorator.

By VEE PICTON

CARE to try the handcrafts of drying or waxing fresh flowers? They were popular to flower arrangements in Victorian times, and are once again making a comeback. This is probably because they blend in so admirably with all types of period furnishings used in so many homes today.

The main principle of course, is to remove all moisture, while still preserving the flower's natural color and shape.

The methods given here are simple and cheap to try. The finished results are well worth the effort.

SAND METHOD

For all types of flowers except blue ones. This way of preserving is ideal for large quantities. Line shallow pans with tinfoil and fill each one with clean, dry, sifted sand.

Heat the sand in an oven at 350 deg. for one hour to sterilise — this kills any insect larvae.

Arrange freshly picked blooms face up in a box and strengthen stems with florist wire. Sprinkle sand around flowers until completely covered. Proceed until box is completely filled with flowers in layers. Always make certain that each layer is well covered with sand before starting the next. Large sprays of flowers can be arranged in sand, just one spray to a box.

Use your own judgment in arranging the flowers.

Store boxes in a cool dry place, and arrange one spray in the sand for examining as the time factor will vary climatically in different areas.

GLYCERINE AND WATER

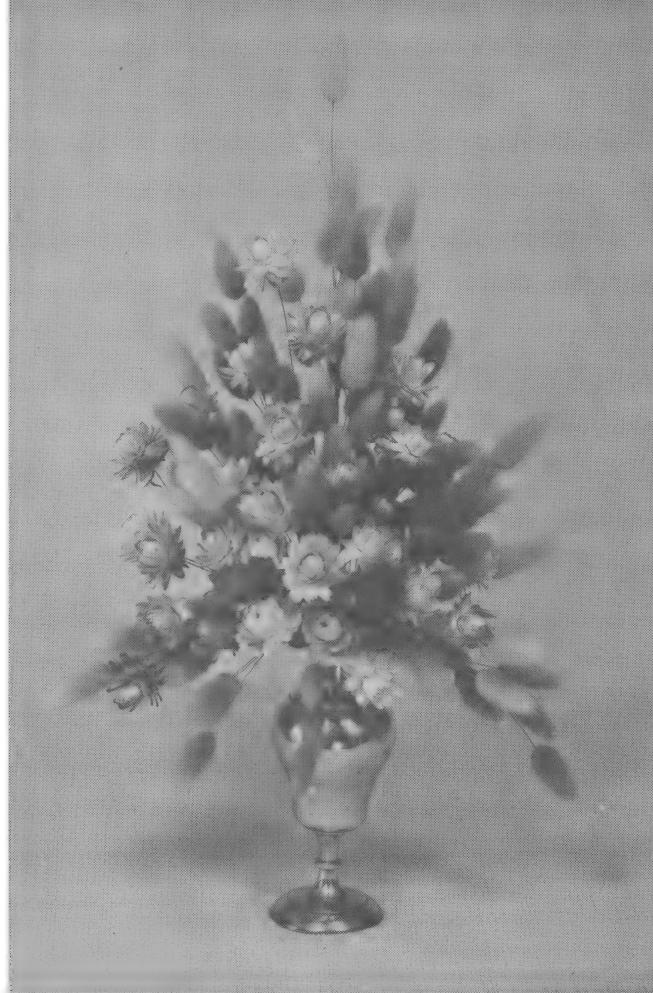
For all green foliage — Fill a deep container with one part glycerine, and two parts water. Crush woody stems of the foliage to help absorption. Stand them in this solution for about 36 hours, then hang upside down to dry. Material treated with this method can also be placed in water with fresh flowers.

THE WAXED METHOD

Fresh flowers done in this fashion are beautiful for festive occasions. They make especially beautiful floating arrangements. All that is needed is some paraffin wax and the freshly picked blooms. This wax is used in the manufacture of such things as candles, waxed paper, and for various kinds of water-proofing.

Choose flowers from the thick petal kind with sturdy stems. Delicate, fragile flowers, are unsuitable for wax dipping. Rinse flowers in cold water and place on an absorbent kitchen paper towel until dry. Into the top half of a double boiler saucepan, put two pounds of paraffin wax. Leave until melted. This amount of wax is more than you will need, but it does make the waxing easier to do and it can be re-used many times.

Allow the melted wax time



to cool to a lukewarm temperature and skim off any floating wax particles. This also can be melted and used again.

Grasp the flower firmly by its stem and dip the head completely into the wax. Swish it around very gently, to make quite certain that all the petals have been treated. Lift out and shake briskly over the pot, so that any droplets of unwanted wax fall into it.

Quickly loosen all the petals, and lay the flower right way up, on to your open palm. You will find that the wax sets almost immediately.

Have ready a small bowl of cold water. Dip the waxed flower into this, making certain to immerse all the waxed area. Place the finished bloom on to a tray lined with tin foil. Working as swiftly as possible, continue in this manner until all flowers required have been done, then put the tray of flowers into the freezer compartment of the refrigerator. This is just to firm up the wax, so take care not to freeze them. Keep stored on a shelf in your

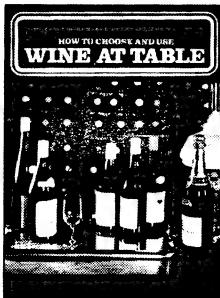
refrigerator until required to decorate your party table.

The stems can be clipped off if desired for floating in small bowls. Leaves can be left on when waxing the flowers, or dipped separately.

One beautiful suggestion for an outdoor party, is to float waxed flowers in a miniature garden pool. If you haven't a ready-made one available, try making one for the occasion with an outsized basin or large tub. Hide the edges with a few well selected rocks and greenery.

As you experiment and discover ways of your own to use them, these easy to make, floating flowers, will delight your guests and give you endless fun. □

Footnote: "The Creative Art of Flower Arrangement" by Lena Malouf, contains simple instructions and diagrams to give a thorough coverage of all the principles of artistic floral design including dried flowers. It is published by K. G. Murray, 142 Clarence Street, Sydney, and available at all bookstores at \$8.50.



by John H. McPherson

HOW TO CHOOSE AND USE WINE AT TABLE

This most interesting, informative book, tells the reader in simple terms all the fundamental facts about wine. It explains the basics of wine making, the types of wine and their characteristics. Also covered are wine terms, the laying down of a cellar, selection, serving, labels, bottles and glasses.

Learn all about wine, look for

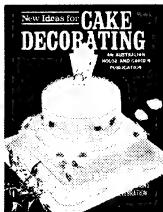
HOW TO CHOOSE AND USE WINE AT TABLE

at your local bookstore . . . \$1.85

MAKE A DECORATIVE CAKE

This brand new collection of the best and latest ideas in cake decorating will be of great interest to the enthusiast, or those preparing for a special occasion. Some ideas included are:

- an octagonal frangipani cake
- a four tier heart cake
- a three tier wedding cake featuring orchids
- recipes for rich fruit cakes



New Ideas for CAKE DECORATING

AT ALL NEWSAGENTS \$1

THE ROO DOG THAT NEVER WAS

BUSH TELEGRAPH

K. F. LORD tells the story of how he and his brother were rewarded for a deed with a kangaroo dog.

MY younger brother and I through the period of growing up, were inseparable. Experiences and adventures were had together — we shared them all.

One day, all of 70 years ago it would be, we were roaming about in our back paddock when we came across a bullock team, the wagon high with milling logs. We had seen the man with the team before — we knew him as George.

George spoke with a lisp and I remember that we kids liked to listen to his funny way of speaking.

"Listen boys," he said to us, "you have just come in time to be a big help to me. I'm a little bit bogged."

So when George straightened the team up for the pull, we picked our bullock and waded in. I doubt if any other bullocks in the team pulled as hard as ours.

"Now boys," said George, "you got me out of my bog and I'll tell you what I am going to do. I have a kangaroo dog at home and I am going to give it to you."

A kangaroo dog! There was nothing in the world we wanted more. A dog that could catch a rat before it could get into a log and save us all the chopping we had previously done to get it out — one that could pull down a kangaroo. And we had just been given such a dog! George was our hero.

There was no sign of George when we called at the house he told us to, but we were met by a woman.

"Oh," she said, "you have come for the dog. Just a minute, I'll get him."

Presently she returned, leading the sorriest looking cur we had ever seen. No one could insult a breed of dogs by calling it a breed.

"But," we stammered, "George said a 'roo dog."

"And so this one is," said the woman, "he is very good

after kangaroos."

What we suffered in our disappointment, there are not words to tell. Gone were our dreams of happy hunting days, of collecting rat scalps worth tuppence and kangaroo skins, worth to us, a fortune.

We brightened a little with the idea that though our dog wasn't good to look at, he just might be able to chase a rat into a log. So next morning we took him out into the bush to try him out.

We put up a rat which left its nest in front of us and hopped away, with us racing after it, as we always did, yelling to the dog, "After him, Sandy — skitch 'im Sandy!"

But Sandy was tearing through the scrub in a different direction altogether, yelping his head off, doing a complete circle now and again and then jumping into the air for a better look for something that wasn't there. After a bit he came back to us and no dog has ever been so near to, and yet escaped, being the victim of a murder as Sandy was at that moment.

Sandy would chase after every animal he saw. He chased the horse, made a grab at it and got his teeth caught in its tail, was swung from side to side and yet escaped being kicked to death as he was taken at a galloping pace around the horse paddock.

He chased the milking cows out of sight and was just measuring his run for a pig when the 'voice of authority' put an end to it all.

"Catch that mongrel and tie it up and tomorrow, you kids take it back to where you got it, and leave it there!"

George, our hero of a couple of days ago was now a fraud and an enemy. We hated him. □

FOR MORE "GET UP AND GROW" FERTILISE WITH **McKay**

McKay Anhydrous Ammonia (NH₃) Equipment leads the field . . . increases the yield.

With the introduction of Anhydrous Ammonia, the new soil-enriching chemical, has come a new method of application . . . the injection process. And, from Ralph McKay, after years of cost, know-how and planning, has come the equipment for the job . . . the only Australian-made equipment of this type! Specially designed for Australian conditions, McKay applicators and component parts are totally efficient and guaranteed for 90 days against faulty workmanship and materials.



McKay 550 U.S. Gallon Trailed Applicator

For broad acres or row crops, use with 16 x 1" coil tines on a 22 ft. x 3½" square toolbar. Fitted with valves, hoses and metering equipment.

McKay 250 U.S. Gallon Trailed Applicator

Thoroughly field tested and proven for broadacre and row crop work. Use with 12 x 1" coil tines and ammonia knives on 14 ft. x 3½" square toolbar. Optional Equipment: Rod Sealers, and 3-point linkage fittings.



McKay Replaceable Tips

Forged and hard surfaced ready to be welded to the blades. Tested, proven, and backed by the McKay name.

McKay Patented Applicator Knife

Forged and heat treated cutting blade and special seamless (non-blocking) injection tube. Delta Wing Knives also available for shallow sowing.

Naturally, when the makers of Australia's most widely-accepted range of farm implements produce fertilizer equipment, it's good! Whatever the crop, whatever the fertilizing need, there's a McKay profit-grower that's right for the job.

McKay equipment is best by design . . . inbuilt is the capacity to outperform, outlast and outprofit all others.

McKay industry-leadership springs from a combination of materials, workmanship and continual in-the-field research . . . that's why McKay farm implements and components can put more "get up and grow" into your crops and operations—and your profits!



The ideal broadcaster for lime or fertilizer, with an even 35-feet spread. . . .

McKay 754 PORTMEADOW Tractor-mounted Fertilizer Broadcaster

Small, versatile, its fame is spreading. Designed to fit all tractors with P.T.O., and standard 3-point linkage equipment.

- Choice of hopper sizes—240 lbs. or 450 lbs. capacity.
- Variable feed rates from zero to a maximum dependent on speed of operation.
- Agitators ensure a full, even continuous flow.
- Roller bearings used throughout. • Safety clutch prevents undue strain on the gearbox, crown wheel and pinion.

Get more from your land with the cost-cutting

McKay 755 PORTFIELD BROADCASTER

Tractor-trailed. Pneumatic tyres. Patented 'Cushion Drive' absorbs shock and protects mechanism. 1950 lbs. capacity hopper. Positive, even feed, spreads Super effectively at speeds from 3 to 12 m.p.h. depending on conditions.

For farm, orchard or vineyard. . . .

McKay PORTVALE Tractor-mounted Fertilizer Dropper

Available in two sizes: 770 lbs. capacity with 7' 6" sowing width, 520 lbs. capacity with 5' sowing width. Patented feed agitator gives a steady fertilizer flow at the exact rate required. Will not pack or clog. Tractor wheel sprockets available to fit all tractor models.

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GINGER: SMALL INDUSTRY—BIG EXPORTS

By A. W. BOSSER

Australia's only ginger factory is doing its bit in earning export income for the country.

AUSTRALIA as a top primary producer has already emerged as a successful competitor in many world markets. But did you know we lead the world as a ginger exporter?

We have one of the only ginger processing factories in the world. This is in sunny Buderim, 60 miles north of Brisbane and a few miles from the glorious Sunshine Coast of Queensland.

The factory at Buderim produces the well-known Merrybud ginger. It is run by the Buderim Ginger Growers Co-operative. The ginger industry was founded on a commercial basis at Buderim nearly 30 years ago.

Under wise management a new \$250,000 expansion program was completed this year. This has meant the addition of new buildings and processing plant, adding 1000 tons to the processing capacity in preserved ginger production for the current 12 months.

On top of all this achievement, our own ginger factory won an export award for the year. The award was made as a result of the Buderim co-operative overcoming serious problems of decentralisation, and for competing with Asian producers of ginger in successfully selling to the major world markets.

Ginger for preserving is grown commercially only in southern China, Formosa, and Hong Kong. Dried ginger for essence extraction or grinding as a spice is grown mainly in Jamaica, Sierra Leone, India, and Nigeria.

The factory for processing and marketing of ginger is claimed by the Buderim co-



operative to be the only one in the world.

The name ginger — of golden hue — brings up all sorts of exotic ideas of eastern spice islands and early English expansion by mercantile traders and explorers, amassing colossal fortunes.

The growing of ginger dates right back into antiquity. It is an unusual plant, being indigenous to Asia, growing prolifically in its wild state. For many centuries Asians have grown ginger as a garden vegetable, using it in almost all their cooking. They also grow it for medicinal purposes, more particularly in aiding indigestion.

It was just on the turn of this century that ginger growing commenced in Australia, and this was at Buderim. This is ideal country for that type of plant, as there is an exceptionally high rainfall combined with an extensive supply of sunshine, as well as rich volcanic soil.

These three attributes combined go to produce a ginger of outstanding flavor and essential oil content. Ginger is a fibrous rooted perennial plant with a compact underground stem: rhizome. This rhizome develops leafy foliage which grows up to 3 ft above ground.

The plant is a native of tropical regions where it normally frequents shade, and in sub-tropical areas it grows only in a moist environment.

Ginger needs well-drained terrain, therefore sloping land has a distinct advantage. However, relatively flat land is also planted, where surface drains are constructed to prevent any buildup of water. Ginger is frequently grown under sawdust mulch which conserves soil moisture and suppresses

Australia's only ginger factory exports to leading markets in many parts of the world.

weed growth between rows.

Frost destroys the foliage and high temperatures cause sunburn when humidity is low. High rainfall—68 in. a year in the area—high temperatures, and high humidity during the growing period,

Electric slicing may replace hand labor in the processing section of the Buderim ginger factory.



make the area around Buderim ideal for growing ginger.

Irrigation is playing a dual role in the ginger industry. During the early growing period irrigation is used in the heat of the summer days to cut the risk of sunburn to the young plants.

Irrigation is playing an important part in the development of the industry by not only increasing the yield per acre but virtually guaranteeing the production estimated for any one year.

Consistency of supply at a stable price thus becomes possible, this being a major feature for overseas markets.

Before planting, between August and mid-October, the ginger growing land is thoroughly cultivated and heavily fertilised.

Various types of mechanical planters have been developed, which dig the furrow,

drop and cover the fertiliser, drop and cover the seed, then hill and row where desired.

Three crops are harvested during the year — an early crop, then a first and a second late crop. The early crop is harvested in a three-week period commenced late February or early March. Harvest time is critical as the fibre develops rapidly.

Harvest is essential when the ginger plants have not reached maturity and therefore have still got very little fibre content, and are tender young succulent material ideal for preserving.

The first late crop is harvested in May or June for production of dried peel whole root for the essence and aerated waters trades. This is because oleo resin and oil of ginger content is higher at this stage.

The second late crop is harvested from July to November, depending on the size of the crop. The ginger in this harvest is dug mechanically as the plant is fully matured and is less susceptible to injury. This ginger is dehydrated and sold as spice.

The early crop is delivered to the factory mainly in bulk containers. It is washed then scrubbed clean by mechanical process. Weighing then takes place and random samples are taken for grading, which is the basis upon which payment to the grower is calculated.

As processing is throughout the entire year, the ginger is stored in large brine filled concrete vats to prevent any deterioration during the preprocessing period. The brine is continually

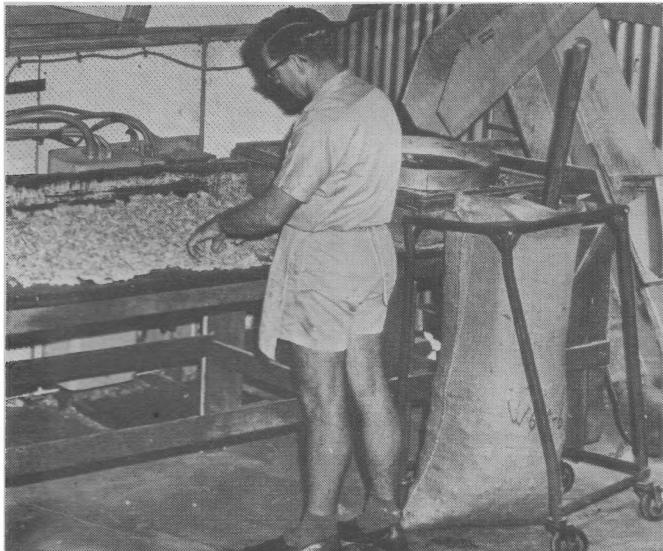
throughout the world require ginger processed in various sizes and at specific sugar levels for different end uses.

The factory at Buderim is the only ginger factory in the world using the modern sophisticated techniques necessary to accomplish this.

The first late crop is processed for extraction of the oleo resins and essential oils. From the second late crop ground ginger is processed for the spice trade and domestic household use. This is with the very latest equipment to ensure a product of high quality standards.

Marketing is controlled by the Buderim co-operative. Growers are given acreage assignments each year, and the ginger grown on the assigned area is sold at pre-arranged prices.

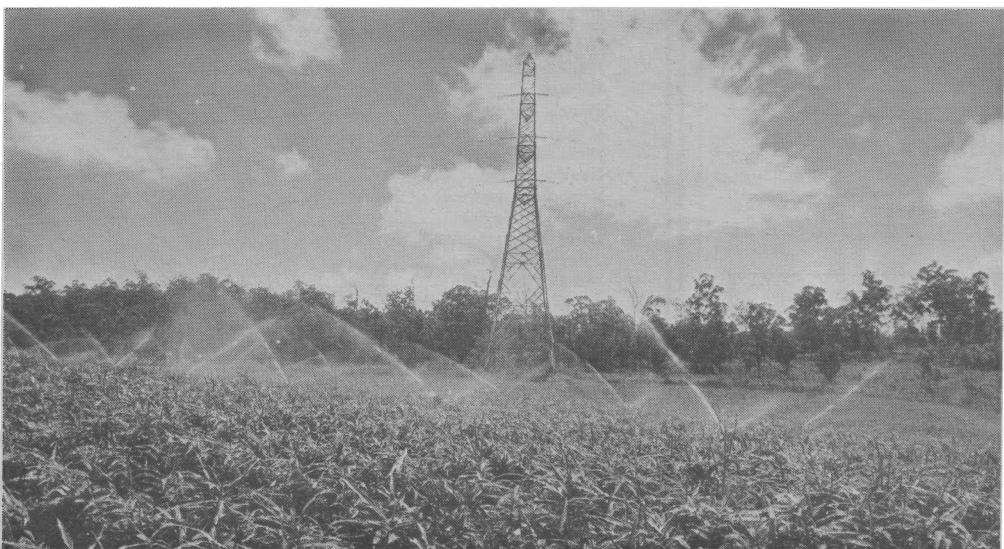
The early crop from which



Individual manufacturers

Workers pick over ginger by hand at the Buderim Ginger Growers co-op, 60 miles from Brisbane.

Irrigation is used to ensure fairly even crop production at Buderim on Queensland's south coast.



As a result of sales missions over the last few years the sales to these areas have increased substantially. In addition, new markets have been established in South Africa, Germany, Holland, Malaysia, and Singapore, and products have already been exported to these countries.

Intensive research on an ever-increasing scale is continuing in close co-operation with the Qld Department of Primary Industries and CSIRO.

Field days are arranged by the co-operative to ensure that new growers are adequately informed on the techniques of growing ginger, as well as letting other growers know of new advances through research.

The co-operative is well up in public relations, averaging 1500 visitors a day to inspect the factory in holiday periods, together with color films, samples, hampers, and presentation packs. □

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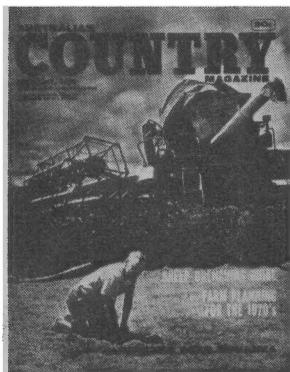
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ADVERTISERS' INDEX

Aust. Fertilisers	33
Aust. Motor Ind.	83
A.W.A.	27
F. N. Bethune	10
Caltex Oil	20
Canning & Sons	5
Capitol Motors	29
J. I. Case	25
Cyclone KM Products	13
Dalgety & N.Z.	47
D.G.M. Frigrite	71
Elder Smith	14
J. T. Ellis & Sons	15
Fonthill Stud	12
Franklin Electric	79
Gilman	24
James Hardie	4
Hardy Spicer	75
Hickson's Timber	26
Honda Motor	30
Horwood Bagshaw	87
Inter. Harvester	72
Lister Blackstone	80
John Lysaght	17
Massey Ferguson	8, 9
Merck Sharp & Dohme	OBC
Ralph McKay	95
Napier	22
Neta Industries	66
John Shearer	6
Stead & Baker	16
Stoltz Tech.	78
Thiess Equipment	IFC, 52, IBC
Vic. Tractor Supplies	78
Wade Thomas	16
Wetmore Pty. Ltd.	11

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